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INTEGRATION MODEL (AIM) DATA REDUCTION  
COMPUTER PROGRAM, DATA ITEM NO. 54.16  
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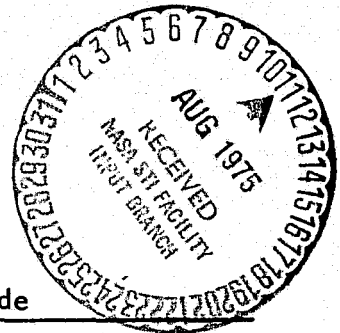
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## FOREWORD

This analytical report is submitted to the NASA Langley Research Center by the AiResearch Manufacturing Company of Los Angeles, California, in accordance with the guidelines of Paragraph 5.7.3.2.1, NASA Statement of Work L-4947-B (Revised).

The report describes Computer Program TSKTSK, which was utilized to analyze the performance of the Aerothermodynamic Integration Model (AIM) on the IBM 360-670 at the NASA-Lewis Research Center.



## CONTENTS

<u>Section</u>		<u>Page</u>
1.	INTRODUCTION	1-1
2.	SUMMARY	2-1
3.	CHEMICAL EQUILIBRIA	3-1
4.	WIND TUNNEL	4-1
	4.1 Calibration Data	4-1
	4.2 Normal Shock - Inlet Spike Tip	4-2
	4.3 Normal and Conical Shock Solution - Inlet Spike	4-3
	4.3.1 Total Conditions - Spike Tip	4-3
	4.3.2 Total and Static Conditions - Surface of Cone	4-3
	4.3.3 Conical Flowfield	4-3
	4.3.4 Conical Shock	4-5
	4.3.5 Static Conditions - Spike Tip	4-6
	4.3.6 Solution	4-7
	4.3.7 Total Conditions - Windtunnel	4-7
5.	INLET	5-1
	5.1 Static Conditions - Inlet Unstarted	5-2
	5.2 Static Conditions - Inlet Started	5-3
	5.3 Total Conditions	5-3
	5.4 Inlet Performance	5-4
6.	COMBUSTOR	6-1
	6.1 Momentum Equation	6-2
	6.2 Continuity Equation and Equation of State	6-3
	6.3 Energy Equation	6-3
	6.4 Solution with no Fuel Injection	6-4
	6.5 Solution After Fuel Injection	6-4





## CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	6.6 Sonic Velocity - Combustor Throat	6-5
	6.7 Regeneratively-Cooled Engine Simulation	6-5
	6.8 Fictive Combustor	6-6
7.	NOZZLE	7-1
	7.1 Expansion to Exit Area	7-1
	7.2 Expansion to Ambient Pressure	7-1
	7.3 Performance	7-2
	7.4 Fictive Nozzle	7-2
8.	ENGINE PERFORMANCE	8-1
	8.1 Calculated Internal Performance	8-1
	8.2 Measured Internal Performance	8-1
9.	DESCRIPTION OF PERFORMANCE OUTPUT	9-1
10.	COMPUTER PROGRAM OPERATION	10-1

## REFERENCES

### Appendices

A	PROGRAM LIBRARIES	A-1
B	PROCEDURES	B-1
C	TYPICAL PROGRAM EXECUTION	C-1



# LIST OF SYMBOLS

<u>Symbol</u>	<u>Description</u>	<u>Unit</u>	
		<u>Internal</u>	<u>External</u>
A	area	in. <sup>2</sup>	in. <sup>2</sup>
$A_o/A_c$	mass flow ratio		
$a_{ij}$	formula numbers (number of atoms of ith element in jth species)	gm-atoms/mole	--
$b_i^o$	specific formula numbers (total number of gm-atoms/gm of element i in the chemical system)	gm-atoms/gm	--
$C_D$	drag coefficient	--	--
$C_{DA}$	addition drag coefficient	--	--
$C_F$	friction coefficient	--	--
G	Gibbs free energy	cal/gm	--
g	functional - Equation 3.7	cal/gm	--
g	acceleration of gravity	$9.80665 \frac{\text{gm} \cdot \text{m}}{\text{gm}_f \cdot \text{sec}^2}$	$32.174 \frac{\text{lbm}}{\text{lbf}} \frac{\text{ft}}{\text{sec}^2}$
h	enthalpy	cal/gm/R	Btu/lbm
HP	assigned enthalpy-pressure problem		
$I_{VAC}$	vacuum specific impulse	$\frac{\text{gm}_f}{\text{gm}_m} \text{ sec}$	$\frac{\text{lbf}}{\text{lbm}} \text{ sec}$
j	energy conversion factor	$426.65 \text{ gm}_f \cdot \text{m}/\text{cal}$	$778 \text{ lbf} \cdot \text{ft}/\text{Btu}$
$K_D$	process efficiency	--	--
M	Mach number	--	--
MW	molecular weight		



# LIST OF SYMBOLS (Continued)

Symbol	Description	Units	
		Internal	External
$n$	1/molecular weight	$\frac{\text{gm-moles}}{\text{gm}}$	$\frac{\text{lbm-moles}}{\text{lbm}}$
$n_j^\alpha$	composition variables (number of moles of species $j$ in the phase $\alpha$ )	moles/gm	--
$O/F$	oxidant-to-fuel ratio	--	--
$p$	pressure	ATM	psia
$Q$	heat transferred into or out of engine	Btu/sec	Btu/sec
$q$	dynamic pressure	ATM	$\text{lb/in.}^2$
$R$	$R_o/MW$ (also see eq. 4.3.3.3)	$\text{cal/gm-}^\circ\text{K}$	$\text{Btu/lbm-}^\circ\text{K}$
$R_o$	universal gas constant (1.987165)	$\text{cal/mole-}^\circ\text{K}$	$\text{Btu/mole-}^\circ\text{R}$
$S$	entropy	$\text{cal/gm-}^\circ\text{K}$	$\text{Btu/lbm-}^\circ\text{R}$
SP	assigned entropy-pressure problem		
$T$	temperature	$^\circ\text{K}$	$^\circ\text{R}$
TP	assigned temperature-pressure problem		
$V$	velocity	m/sec	ft/sec
$w$	mass flow	$\frac{\text{ATM-in.}^2}{\text{sec}} \left( \frac{\text{mass units}}{\text{force units}} \right)$	lbm/sec
WF	weight fraction	--	--
$\alpha$	angle of attack	radians	degrees
$\beta$	fuel injection angle	radians	degrees
$\gamma$	isentropic exponent		
$\delta$	denotes variation of	--	--

# LIST OF SYMBOLS (Continued)

<u>Symbol</u>	<u>Description</u>	<u>Internal</u>	<u>Units</u>	<u>External</u>
$\eta$	angle of ray in conical flow field	radian		degrees
$\eta_c$	combustor efficiency	--		--
$\eta_{KE}$	kinetic energy efficiency	--		--
$\eta_i$	ray angle in conical flow field	radians		degrees
$\eta_s$	conical shock angle	radians		degrees
$\eta_o$	angle of inlet spike conical surface	radians		degrees
$\lambda_i$	Lagrangian multiplier for element i	cal/gm-ATM		--
$\mu_j^\alpha$	chemical potential	cal/mole		--
$\rho$	density	$\frac{\text{mass}}{\text{force}} \frac{\text{ATM}}{\text{m}}$		--
$\epsilon$	convergence criterion( $1 \times 10^{-4}$ )	--		--
$\theta$	flow angle	radians		degrees



# LIST OF SYMBOLS (Continued)

<u>Subscripts</u>	<u>Description</u>
ST	SPIKE TIP
CL	COWL LIP
F	denotes conditions relating to fuels
FZ	frozen composition
n	nozzle
O	denotes conditions relating to oxidants
r	denotes conditions related to regeneratively-cooled engine simulation (also radial component)
T	denotes total conditions
t	denotes tangential component
0	denotes conditions in wind tunnel
1	denotes conditions at spike tip
2	denotes conditions at inlet throat
2', 2''	denotes conditions at inlet normal shock
3	denotes conditions on surface of inlet spike conical section
4	denotes conditions at combustor exit (also conditions downstream of conical shock)
6	denotes conditions at nozzle exit
$\eta$	denotes conditions on ray in conical flow field



## LIST OF SYMBOLS (Continued)

<u>Superscripts</u>	<u>Description</u>
(n)	nth iteration
(m)	mth iteration
(i)	initial estimate
(n')	nth iteration of a secondary calculation of a variable



## 1. INTRODUCTION

The data reduction program for the HRE-AIM engine tests was designed to execute interactively on the NASA-Lewis Research Center's IBM 360/67 under the TSS operating system. Personnel at the NASA-Lewis Research Center wrote the routines to acquire, calibrate and interpolate the test data, to calculate the axial components of the pressure-area integrals and the skin-function coefficients and to report the raw data in engineering units.

The routines used to calculate flow conditions in the wind tunnel, inlet, combustor and nozzle and the overall engine performance were written by AiResearch personnel. Certain of the subroutines in References 1 and 2 were modified and used to obtain species concentrations and transport properties in chemical equilibrium at each of the internal and external engine stations.

The execution of the data reduction program required a programmer constantly interacting with the computer terminal during all executions of the program. In addition, the calibration and test configuration data and channel assignments, some of which were changed from test to test, were contained in several block data subroutines. The transcription of data from the instrumentation sheets to these subroutines constituted a major source of error. Consequently, many man-hours were required to transcribe and check the data and to insure that the proper block data subroutines were loaded prior to each execution. It was also necessary to assign fuel injector, ignitor and fuel supply value configurations via procedures prior to each execution.

In view of the difficulties experienced during reduction of data from the AIM tests, it is recommended that future test plans include the configuration, calibration and channel assignment data on a magnetic tape generated at the test site immediately before or after a test, and that the data reduction computer program be designed to operate in a batch environment.



## 2. SUMMARY

Three methods were used to obtain the Mach number in the wind tunnel. The first method used wind tunnel calibration data, the second used measured wind tunnel total pressure and temperature and the pitot pressure on the inlet spike tip with the normal shock equations, and the third used the measured wind tunnel total temperature, the pitot pressure on the spike tip and a static pressure on the conical section of the inlet spike with the normal and conical shock and conical flow field equations. Close agreement was obtained with the three methods. However, at the nominal Mach 5 test conditions, the wind tunnel calibration data was incomplete. Therefore, the first method was used to obtain the wind tunnel Mach number for the nominal Mach 6 and 7 tests and the second method for the nominal Mach 5 tests. Use of the third method was eventually discontinued because it required excessive computer time.

The conditions at the inlet throat were determined by computing the momentum and total enthalpy from the pressure forces and friction and heat losses incurred on the inlet spike and internal surfaces. The inlet mass flow ratio and additive drag were determined from theoretical calculations (Reference 3). When the inlet was started ( $M_2 > 1$ ), the measured static pressures at the throat were not used, and the mass-momentum-averaged static pressure was calculated. When the inlet was unstarted, the average of the measured static pressures at the throat was used with the Mach number constrained to unity to calculate spillage and additive drag.

In both cases, the flow was expanded to the free-stream static pressure to obtain kinetic energy and process efficiencies. Total conditions were obtained by compressing the flow isentropically until the calculated enthalpy matched the known total enthalpy. When the inlet was started, a side calculation was made by isentropically expanding the flow to an area 10 percent larger than the throat area. At this point, the flow was passed through a normal shock. The limiting inlet pressure recovery, kinetic energy and process efficiencies were determined from conditions downstream of the normal shock.

Two methods were used to calculate conditions at the combustion stations. Up to the first station where fuel was injected, the mass-momentum-averaged static pressure that satisfied the state, continuity, momentum and energy equations was calculated. After fuel was injected, the average of the measured inner- and outerbody pressures was used, and the combustor efficiency was calculated to satisfy the conservation equations. The combustor efficiency was defined as the weight fraction of reacted hydrogen in chemical equilibrium to the total injected hydrogen. The unreacted hydrogen was assumed to be inert, i.e., it was not permitted to dissociate or to react with other species.





The combustor throat was defined as the point of minimum flow area between the struts in subsonic combustion, and at the strut exit plane in supersonic combustion. When the Mach number at the combustor throat was less than 0.95, a side calculation was made of the combustor efficiency required to produce sonic velocity at the throat.

The regeneratively-cooled combustor performance was simulated by recalculating the total enthalpy at the combustor exit as the sum of the free-stream enthalpy of the synthetic air, the enthalpy of the hydrogen fuel at 50 degrees Rankine, and the absolute value of the heat loss through the nozzle surfaces.

Engine performance was obtained by isentropically expanding the flow from the actual and regeneratively-cooled combustor exits both to the nozzle exit area and to ambient pressure. The flow was then isentropically expanded from the actual combustor throat to those nozzle locations having static pressure taps, and the local skin friction coefficients were calculated. The nozzle vacuum stream thrust coefficient was obtained from the surface-pressure integrals and the friction drag on the nozzle walls, and the stream thrust (momentum) at the combustor throat and nozzle exit.

Side calculations were made of a fictitious constant-pressure zero-velocity combustor at 100 percent combustor efficiency with isentropic expansion to ambient pressure to obtain the combustor effectiveness, and of a fictitious nozzle to determine the static and total conditions required to match the actual vacuum specific impulse at the nozzle exit.



### 3. CHEMICAL EQUILIBRIA (Reference 4)

The chemical equilibrium program minimizes the Gibbs free energy as the condition for chemical equilibrium with the independent variables

$$T = T_0, \quad (3.1)$$

$$P = P_0, \quad (3.2)$$

and the composition variables  $n_j^\alpha$  which represent the number of moles of species  $j$  in the phase  $\alpha$ . The Gibbs free energy can be written

$$G = G(p, T, n_j^\alpha). \quad (3.3)$$

Since the Gibbs free energy is an extensive property, equation 3.3 must be a first degree homogeneous function in  $n_j^\alpha$ . This leads to

$$G = \sum_{j,\alpha} \mu_j^\alpha n_j^\alpha \quad (3.4)$$

where the chemical potential  $\mu_j^\alpha$  is defined

$$\frac{\partial G}{\partial n_j^\alpha} \equiv \mu_j^\alpha. \quad (3.5)$$

The conservation of elements in the chemical system (which constitutes the constraints on the variations  $\delta n_j^\alpha$ ) may be written

$$\sum_i \left( \sum_{j,\alpha} a_{ij} n_j^\alpha - b_i^0 \right) = 0 \quad (3.6)$$

where the formula number  $a_{ij}$  represent the number of atoms of the  $i$ th element in the  $j$ th species, and the specific formula numbers  $b_i^0$  represent the total number of gram-atoms of element  $i$  in the system.

The fundamental function for the variational problem may be written from equations 3.3 and 3.6 as

$$G + \sum_i \lambda_i \left( \sum_{j,\alpha} a_{ij} n_j^\alpha - b_i^0 \right) \quad (3.7)$$

where the Lagrangian multipliers  $\lambda_i$  were introduced so that all of the  $\delta n_j^\alpha$  could be considered independently variable. The condition for equilibrium is obtained by setting the first variation of the function 3.7 equal to zero.

$$\begin{aligned} \delta g = & \sum_{j,a} \left( \mu_j^\alpha + \sum_i \lambda_i a_{ij} \right) \delta n_j^\alpha \\ & + \sum_i \left( \sum_{j,\alpha} a_{ij} n_j^\alpha - b_i^0 \right) \delta \lambda_i = 0 \end{aligned} \quad (3.8)$$

Treating the  $\delta \lambda_i$  and  $\delta n_j^\alpha$  as independent variations gives

$$\frac{\partial g}{\partial n_j^\alpha} + \sum_i \lambda_i a_{ij} = 0 \quad (3.9)$$

and equation 3.6 which, along with equations 3.1 and 3.2 represents a set of nonlinear equations defining a thermodynamic state of the chemical system that can be solved by iterative techniques to obtain the equilibrium compositions of the species and the Lagrangian multipliers.

The use of equations 3.1 and 3.2 in forming the Function 3.7 implies that the thermodynamic state of the chemical system was specified by assigned temperatures and pressures. Hereafter, this specification will be referred to as the TP problem. In general, any two equations involving  $T$ ,  $p$ , and  $n_j^\alpha$  may be used to define the thermodynamic state. Equation 3.1 may be replaced by

$$h(T, p, n_j^\alpha) = h_0 \quad (3.10)$$

where  $h$  is the enthalpy and  $h_0$  is a constant equal to the enthalpy of the reactants to define the HP problem, or by the entropy function

$$S(T, p, n_j^\alpha) = S_0 \quad (3.11)$$

to define the SP problem. The problem designations TP, HP, and SP will be used in the following paragraphs to describe the thermodynamic-state calculations.

#### 4. WINDTUNNEL

The three methods used in calculating the windtunnel flow conditions are discussed in detail in the following paragraphs.

##### 4.1 CALIBRATION DATA

Prior to testing the AIM engine at the nominal Mach 5, 6 and 7 conditions, instrumentation rakes were installed just upstream of the inlet spike tip to measure pitot and static pressures (Reference 5). These pressures along with the measured total temperature were used to calculate the Mach number profile in the windtunnel test section, and an average Mach number was obtained as a function of windtunnel total pressure and temperature for the Mach 6 and 7 test conditions. Wind tunnel flow conditions are completely defined with these two state variables and the Mach number.

The TP problem was solved with the total pressure and temperature to obtain the total enthalpy ( $h_{To}$ ) and entropy ( $S_o$ ). An estimate of the static pressure ( $p_o$ ) was obtained from the ideal-gas relationship

$$p_o^{(1)} = p_{To} / \left(1 + \frac{\gamma-1}{2} M_o^2\right)^{\frac{\gamma}{\gamma-1}},$$

and the SP problem was solved to obtain the static conditions in the wind-tunnel. The Mach number was obtained from

$$M_o^{(1)} = v_o^{(1)} / a_o^{(1)}$$

where

$$v_o^{(1)} = \left( \sqrt{2gJ(h_T - h^{(1)})} \right)_o$$

and

$$a_o^{(1)} = \left( \sqrt{\gamma gJ RT} \right)_o^{(1)}$$

Solution of the SP problem was repeated with new estimates of  $p_o^{(n)}$  until

$$\left| 1 - M_o^{(n)} / M_o \right| < \epsilon.$$

Normally, the conditions downstream of the normal shock at the inlet spike tip would be based on the invariance of the momentum, energy and continuity across the shock. Since the pitot pressure at the spike tip was known, the problem was overprescribed. The flow conditions at the spike tip were obtained by relaxing the invariance of the momentum. The HP problem was solved with the spike tip pitot pressure ( $p_{T1}$ ) and the enthalpy ( $h_{T0}$ ) to obtain the total temperature ( $T_{T1}$ ) and entropy ( $S_1$ ). An estimate of the static pressure ( $p_1^{(1)}$ ) was obtained from the ideal-gas relationship across a normal shock

$$p_1^{(1)} = p_o \left[ 1 + 2\gamma(M_o^2 - 1)/(\gamma + 1) \right] ,$$

and the SP problem was solved with  $p_1^{(1)}$  and  $S_1$  to obtain the static conditions downstream of the normal shock. The mass flow per unit area was obtained from

$$(w/A)_1^{(1)} = (pV/jRT)_1^{(1)}$$

Solution of the SP problem was repeated with new estimates of  $p_1^{(n)}$  until

$$\left| 1 - (w/A)_1^{(n)} / (w/A)_o \right| < \epsilon .$$

#### 4.2 NORMAL SHOCK - INLET SPIKE TIP

The second method for determining the windtunnel Mach number used the conditions across the normal shock at the inlet spike tip. The total conditions on either side of the shock were the same as those in the preceding paragraph. The independent variables were the static pressures,  $p_o$  and  $p_1$ , and the dependent variables were the mass flows per unit area,  $(w/A)_o$  and  $(w/A)_1$ , and the vacuum specific impulse,  $I_{vac1}$  and  $I_{vac2}$ , defined as

$$I_{vac} = V/g + p/(w/A) .$$

The averaged values of static pressure from the method described in the preceding paragraph were used as the initial estimates for  $p_o^{(1)}$  and  $p_1^{(1)}$ . The SP problem was solved on both sides of the normal shock with  $p_o^{(1)}$ ,  $S_o$  and  $p_1^{(1)}$ ,  $S_1$  to obtain  $(w/A)$  and  $I_{vac}$ . The estimates of static pressure,  $p_o$  and  $p_1$ , were perturbed separately to obtain the elements of a  $2 \times 2$  Jacobian matrix - the partial derivatives of the  $(w/A)$  and  $I_{vac}$  over the static pressures. The Jacobian was then inverted to obtain new estimates of the static pressures  $p_o^{(2)}$  and  $p_1^{(2)}$ . Solution of the SP problem was repeated on both sides of the normal shock with static pressure perturbations and matrix inversions until

$$\left| 1 - (w/A)_0^{(n)} / (w/A)_1^{(n)} \right| < \epsilon$$

and

$$\left| 1 - \text{Ivac}_0^{(n)} / \text{Ivac}_1^{(n)} \right| < \epsilon$$

The windtunnel Mach number was determined from this method for the nominal Mach 5 tests since the calibration data was incomplete.

#### 4.3 NORMAL AND CONICAL SHOCK SOLUTION - INLET SPIKE

The third method solved for the windtunnel conditions based on the static pressure on the conical portion of the inlet spike and the pitot pressure and enthalpy at the blunted tip of the inlet spike. It was assumed that a solution existed as shown in Figure 4-1. An entropy gradient existed near the surface of the cone due to the curved portion of the bow shock. Therefore, it was also assumed that the effect of the entropy layer on the solution of the conical flow equations was negligible. The solution of the problem was obtained by the methods discussed below.

##### 4.3.1 Total Conditions - Spike Tip

The HP problem was solved with the state variables  $p_{T1}$  and  $h_{T1}$  to obtain  $S_1$ .

##### 4.3.2 Total and Static Conditions - Surface of Conical Section

An initial estimate of the total pressure ( $p_{T3}^{(1)}$ ) was obtained from

$$p_{T3}^{(1)} = 0.5(p_{T0} + p_{T1})$$

and the HP problem was solved to obtain  $S_3^{(1)}$ . With  $S_3^{(1)}$  and measured  $p_3$ , the SP problem was solved to obtain the static conditions on the surface of the cone.

##### 4.3.3 Conical Flowfield

An initial estimate for the conical shock angle ( $\eta_s^{(1)}$ ) was obtained from the empirical equation

$$\eta_s^{(1)} = (3\gamma + 1) \tan \eta_o / 2(\gamma + 1) + 1 / (2 M_o^2 \tan \eta_o)$$

where  $\eta_o$  was the angle of the cone. The flowfield between the surface of the cone and the conical shock was constructed from the equations in the hodograph plane



$$(V_r)_{\eta+\Delta\eta} = (V_t)_{\eta} \sin \Delta\eta - (R - V_r)_{\eta} \cos \Delta\eta + R_{\eta} \quad (4.3.3.1)$$

and

$$(V_t)_{\eta+\Delta\eta} = (V_t)_{\eta} \cos \Delta\eta + (R - V_r)_{\eta} \sin \Delta\eta \quad (4.3.3.2)$$

where

$$R_{\eta} = \left[ (V_t)_{\eta} / \tan \eta + (V_r)_{\eta} \right] / \left[ (V_t/a)_{\eta}^2 - 1 \right] \quad (4.3.3.3)$$

and

$$a_{\eta}^2 = (\gamma g j R T)_{\eta} \quad (4.3.3.4)$$

The construction was started from the surface of the cone where the tangential velocity  $(V_t)_{\eta_0} = 0$ . The velocity and flow angles at each successive ray were obtained from

$$V_i^2 = V_{ti}^2 + V_{ri}^2$$

and

$$\theta_i^{(n)} = \eta_i + \tan^{-1}(V_{ti}/V_{ri}) ,$$

and the static enthalpy from

$$h_i^{(n)} = h_{T3}^{(n)} - V_i^2/2gj .$$

An initial estimate of static pressure  $(p_i^{(1)})$  on each successive ray was obtained from

$$p_i^{(1)} = p_{T3}^{(n)} / \left[ 1 + (\gamma-1) V_i^2/2 a_i^2 \right]^{\frac{\gamma}{\gamma-1}} ,$$

and the SP problem was solved with the state variables  $p_i^{(1)}$ ,  $s_3^{(n)}$  to obtain  $h_i^{(1)}$ . New estimates were obtained for  $p_i^{(m)}$ , and the SP problem repeatedly solved until

$$\left| 1 - h_i^{(m)}/h_i^{(n)} \right| < \epsilon .$$

#### 4.3.4 Conical Shock

Upon completion of the flowfield between the surface of the cone and the conical shock, the continuity, momentum and energy equations were used to obtain velocity, static pressure and static enthalpy upstream of the shock. The conditions across the shock were obtained from (see Figure 4-1)





$$\rho_o v_{to} = \rho_4 v_{t4}$$

$$v_{ro} = v_{r4}$$

$$p_o + \rho_o v_{to}^2 = p_4 + \rho_4 v_{t4}^2$$

and

$$h_{To} \equiv h_{T3} \equiv h_{T1}$$

These equations lead to

$$(w/A)_o^{(n)} = (w/A)_4^{(n)} \sin [\eta_s^{(n)} - \theta_4^{(n)}] / \sin \eta_s^{(n)}$$

$$v_o^{(n)} = v_4^{(n)} \cos [\eta_s^{(n)} - \theta_4^{(n)}] / \cos \eta_s^{(n)}$$

$$p_o^{(n)} = p_4^{(n)} + (w/A)_4^{(n)} (v_4/g)^{(n)} \sin^2 [\eta_s^{(n)} - \theta_4^{(n)}] \times \\ \left\{ 1 - \tan \eta_s^{(n)} / \tan [\eta_s^{(n)} - \theta_4^{(n)}] \right\}$$

and

$$h_o^{(n)} = h_{To} - v_o^{(n)2} / 2gj$$

The HP problem was solved with the state variables  $p_o^{(n)}$ ,  $h_o^{(n)}$  obtained from the above equations, and the equation of state was used to calculate

$$(w/A)_o^{(n')} = (pV/jRT)_o^{(n)}$$

and

$$M_o^{(n)} = v_o^{(n)} / (\sqrt{\gamma g j RT})_o^{(n)}$$

#### 4.3.5 Static Conditions - Spike Tip

The initial estimate of the static pressure ( $p_1^{(1)}$ ) downstream of the normal shock at the spike tip was obtained from

$$p_1^{(1)} = p_o^{(1)} \left[ 1 + 2\gamma(M^2 - 1)/(\gamma + 1) \right]_o^{(1)}$$



Then

$$V_1^{(n)} = V_o^{(n)} + g(p_o^{(n)} - p_1^{(n)}) / (w/A)_o^{(n)}$$

and

$$h_1^{(n)} = h_{T1} - V_1^{(n)2} / 2g_j$$

The SP problem was solved with the state variable  $p_1^{(n)}$ ,  $S_1$  ( $S_1$  was calculated in para 4.3.1) to obtain  $h_1^{(n')}$  and  $(w/A)_1^{(n)}$ .

#### 4.3.6 Solution

The system of equations in the preceding paragraphs were reduced to three dependent and three independent variables. These were

<u>Independent</u>	<u>Dependent</u>
$p_{T3}$	$1 - h_1^{(n')} / h_1^{(n)}$
$\eta_s$	$1 - (w/A)_o^{(n')} / (w/A)_o^{(n)}$
$p_1$	$1 - (w/A)_1^{(n)} / (w/A)_o^{(n)}$

The independent variable were perturbed separately, each time repeating the calculations in paragraphs 4.3.2 through 4.3.4 to form a  $3 \times 3$  matrix (Jacobian) of the partial derivatives of the dependent over the independent variables. The matrix was inverted to obtain new estimates of the independent variables. The procedure was repeated until

$$\left| 1 - h_1^{(n')} / h_1^{(n)} \right| < \epsilon,$$

$$\left| 1 - (w/A)_o^{(n')} / (w/A)_o^{(n)} \right| < \epsilon$$

and

$$\left| 1 - (w/A)_1^{(n)} / (w/A)_o^{(n)} \right| < \epsilon.$$

#### 4.3.7 Total Conditions - Windtunnel

Following convergence of the above system of equations, an initial estimate of the windtunnel total pressure was obtained from

$$p_{To}^{(1)} = p_o \left( 1 + \frac{\gamma-1}{2} M_o^2 \right)^{\frac{\gamma}{\gamma-1}}.$$



The SP problem was solved with the state variables  $p_{T0}^{(1)}$ ,  $S_0$  to obtain  $h_{T0}^{(1)}$ . New estimates of  $p_{T0}^{(n)}$  were obtained, and the SP problem was repeated until

$$\left| 1 - h_{T0}^{(n)} / h_{T0} \right| < \epsilon .$$



## 5. INLET

Following the calculation of the windtunnel conditions, the SP problem was solved with the entropy ( $S_1$ ) downstream of the spike tip normal shock and the pressures on the spike and inner cowl surfaces up to the inlet throat and on the total outer cowl surface. The transport properties were obtained from subroutines described in Reference 2, and the skin friction coefficients were obtained by the method of Spalding and Chi described in References 6 and 7 (pp A112-A115a).

The friction drag on the spike and inner cowl surfaces up to the inlet throat and the friction drag on the outer cowl surface were calculated from the procedures outlined in Reference 7 (pp A54-A71).

The conditions at the inlet throat were determined by computing the stream thrust (momentum) and total enthalpy from the pressure integral, friction and heat losses incurred on the inlet spike and internal cowl surfaces. The stream thrust ( $F$ ) was defined

$$F = wV/g + pA, \quad (5.1)$$

and was calculated from

$$F_2 = F_o + \int_0^2 p da - \text{DRAG}_{o,2} + C_{DA} q_o A_c + p_o A_c (1 - A_o/A_c). \quad (5.2)$$

The first term on the right-hand side of equation 5.2 was the stream thrust (momentum) in the windtunnel. The second term was the pressure integral over the spike and internal surface of the cowl evaluated from the spike tip to the inlet throat. The third term was defined as

$$\begin{aligned} \text{DRAG}_{o,2} = & - \int_0^2 C_f q dA_s \cos \delta_s - C_{DST} q_o A_{ST} \\ & - C_{DCL} q_o A_{CL} \end{aligned}$$

Where  $C_f$  is the local skin function coefficient,  $q$  is the local dynamic pressure,  $dA_s$  the local surface area, and  $\delta_s$  the local surface angle on the spike and internal cowl surface. The skin friction coefficients on the cowl ( $C_f$ ) were obtained as described in Reference 7 (pp A112-A115a). The drag forces on the spike tip (ST) and cowl lip (CL) were defined in Reference 7 (pp A54-A71) as



$$C_{DST} q_o A_{ST} = \frac{\pi}{64} \left[ 0.4843 (p_1 - p_o) + 0.97 p_o \right]$$

and

$$C_{DCL} q_o A_{CL} = 1.699 (2.976 q_o + p_o) .$$

The fourth and fifth terms in equation 5.2 represent the pressure integral over the spillage streamline. The additive drag coefficients ( $C_{DA}$ ) and mass flow ratios ( $A_o/A_o$ ) were obtained from theory (Reference 3). The total enthalpy of the synthetic air at the inlet throat was defined as

$$h_{T2} = h_{To} + Q_{o,2}/w_o, \quad (5.3)$$

where  $Q_{o,2}$  was the heat transferred into (+) or out of (-) the mixture through the engine walls with units of Btu/sec. The calculation of the heat loss was described in Reference 8, pages 2-4 through 2-11.

A test was made to determine whether the inlet was started. The critical pressure was defined as

$$p_{cr} = p_o (1 + 0.425 \gamma_o M_o^2),$$

and the arithmetic average of spike pressure ( $\bar{p}$ ) was obtained between stations 35.0 and 38.0. The inlet was considered to be started unless  $\bar{p}$  was greater than  $p_{cr}$ .

### 5.1 STATIC CONDITIONS - INLET STARTED ( $M_2 > 1$ )

When the inlet was started, the measured static pressures at the throat were ignored, and the mass-momentum averaged static pressure was calculated. In order to calculate static conditions at the inlet throat, an initial estimate of static pressure ( $p_2^{(1)}$ ) was obtained from the arithmetic average of measured pressures at the inlet throat and an initial estimate of velocity ( $v_2^{(1)}$ ) was obtained from equation 5.1 as

$$v_2^{(1)} = g (F_2 - p_2^{(1)} A_2) / w_2. \quad (5.4)$$

An initial estimate of static enthalpy ( $h_2^{(1)}$ ) was obtained from

$$h_2^{(1)} = h_{T2} - v_2^{(1)2} / 2g_j, \quad (5.5)$$

and the HP problem was solved with the state variables  $p_2^{(1)}$ ,  $h_2^{(1)}$  to obtain  $(w/A)_2^{(1)}$  and  $S_2^{(1)}$ . New estimates were obtained for  $p_2^{(n)}$ , and the above sequence was repeated until

$$\left| 1 - (w/A)_2^{(n)} / (w/A)_2 \right| < \epsilon .$$

## 5.2 STATIC CONDITIONS - INLET UNSTARTED ( $M_2 = 1$ )

When the inlet was unstated, the arithmetic average of the measured static pressures at the throat was used with the Mach number constrained to unity to calculate spillage and additive drag. Initial estimates of the velocity and static enthalpy were calculated from equation 5.4 and 5.5. The HP problem was solved with the state variables  $p_2, h_2^{(1)}$  to obtain the sonic velocity ( $a_2$ ) where

$$a_2^{(1)} = \sqrt{(\gamma g_j R T)_2^{(1)}}$$

Successive substitutions of

$$v_2^{(n+1)} = a_2^{(n)}$$

in equation 5.5 were made, and the HP problem was repeatedly solved until

$$\left| 1 - v_2^{(n)} / a_2^{(n)} \right| < \epsilon .$$

The actual flow through the inlet throat was calculated, the mass flow ratio and additive drag coefficient were corrected to reflect the spillage and the mass flow per unit area and the momentum were corrected at upstream stations.

## 5.3 TOTAL CONDITIONS

The total conditions at the inlet throat were obtained by isentropically compressing the flow until the calculated total enthalpy matched the known total enthalpy. An initial estimate of the total pressure ( $p_{T2}^{(1)}$ ) was calculated from

$$p_{T2}^{(1)} = p_2 \left( 1 + \frac{\gamma-1}{2} M_2^2 \right)^{\frac{\gamma}{\gamma-1}} ,$$

and the SP problem was solved with the state variables  $p_{T2}^{(1)}, S_2$  to obtain  $h_{T2}^{(1)}$ . New estimates were obtained for  $p_{T2}^{(n)}$ , and the SP problem was repeatedly solved until

$$\left| 1 - h_{T2}^{(n)} / h_{T2} \right| < \epsilon .$$



#### 5.4 INLET PERFORMANCE

In both of the above cases -- inlet started and unstarted -- the flow was expanded isentropically to the windtunnel static pressure ( $p_o$ ). The SP problem was solved with the state variables  $p_o$ ,  $S_2$  to obtain  $h_o'$ , and the kinetic energy ( $\eta_{KE}$ ) and process ( $K_D$ ) efficiencies were calculated from

$$\eta_{KE} = (h_{T2} - h_o') / (h_{To} - h_o') \quad (5.6)$$

and

$$K_D = (h_2 - h_o') / (h_2 - h_o') \quad (5.7)$$

When the inlet was started ( $M_2 > 1$ ), the flow was expanded isentropically to a fictitious area 1.10 times the inlet throat area to determine the limiting inlet pressure recovery. The mass flow per unit area was calculated from

$$(w/A)_{2'} = (w/A)_2 / 1.10$$

and the initial pressure estimate from

$$p_{2'}^{(1)} = 0.9 p_2$$

The SP problem was solved with the state variables  $p_{2'}^{(1)}$ ,  $S_2$  to obtain  $(w/A)_{2'}^{(1)}$ . New estimates were obtained for  $p_{2'}^{(n)}$ , and the SP problem was repeatedly solved until

$$\left| 1 - (w/A)_{2'}^{(n)} / (w/A)_{2'} \right| < \epsilon$$

Next, the flow was passed through a normal shock. The initial estimate of the static pressure downstream of the normal shock was calculated from

$$p_{2''}^{(1)} = p_{2'} \left[ 1 + 2\gamma (M_{2'}^2 - 1) / (\gamma + 1) \right],$$

and the velocity and static enthalpy from

$$v_{2''}^{(n)} = g (p_{2'} - p_{2''}^{(n)}) / (w/A)_{2'} + v_{2'}$$

and

$$h_{2''}^{(n)} = h_{T2} - v_{2''}^{(n)2} / 2g_j$$



The HP problem was solved with the state variables  $p_{2''}^{(1)}$ ,  $h_{2''}^{(1)}$  to obtain  $(w/A)_{2''}^{(1)}$ . New estimates were obtained for  $p_{2''}^{(n)}$  and the HP problem was solved repeatedly until

$$\left| 1 - (w/A)_{2''}^{(n)} / (w/A)_{2''}^{(1)} \right| < \epsilon .$$

The total conditions downstream of the normal shock were determined by isentropically compressing the flow until the calculated total enthalpy matched the known total enthalpy. An initial estimate of the total pressure ( $p_{T2''}^{(1)}$ ) was calculated from

$$p_{T2''}^{(1)} = p_{2''} \left( 1 + \frac{\gamma-1}{2} M_{2''}^2 \right)^{\frac{\gamma}{\gamma-1}}$$

and the SP problem was solved with the state variables  $p_{T2''}^{(1)}$ ,  $S_{2''}$  to obtain  $h_{T2''}^{(1)}$ . The SP problem was solved repeatedly with new estimates of total pressure until

$$\left| 1 - h_{T2''}^{(n)} / h_{T2} \right| < \epsilon .$$

The flow downstream of the normal shock was expanded isentropically to the wind-tunnel static pressure ( $p_o$ ). With the state variables  $p_o$ ,  $S_{2''}$ , the SP problem was solved to obtain  $h_o''$ , and the kinetic energy and process efficiencies were calculated from

$$\eta_{KE}'' = (h_{T2} - h_o'') / (h_{To} - h_o) \quad (5.8)$$

and

$$K_D'' = (h_{2''} - h_o'') / (h_{2''} - h_o) . \quad (5.9)$$

Finally, the limiting inlet pressure recovery ( $\eta_{pT2}$ ) was obtained from

$$\eta_{pT2} = (0.9 p_{T2''} + 0.1 p_{2''}) / p_{To} . \quad (5.10)$$





## 6. COMBUSTOR

Two methods were used to calculate static conditions in the combustor. Up to the combustor station where fuel was first injected, the mass-momentum-averaged pressure was calculated to satisfy the state, continuity, momentum and energy equations. At that station where fuel was first injected and thereafter, the arithmetic average of measured inner- and outerbody pressures was used with a variable combustor efficiency to satisfy the conservation equations. The concept of real and inert hydrogen was used to define combustor efficiency equal to the weight fraction of real hydrogen ( $H_2$ ) in the total injected hydrogen. The inert hydrogen ( $H_{2i}$ ) was not permitted to dissociate or to react with other species.

The combustor throat was defined as the point of minimum flow area between the struts in the subsonic combustion mode, and at the strut exit plane in the supersonic combustion mode. When the Mach number was less than 0.95 at the combustor throat, a side calculation was made to determine the combustor efficiency required to produce sonic velocity at the throat.

The regeneratively-cooled combustor performance was simulated by recalculating the total enthalpy at the combustor exit as the sum of the freestream enthalpy of the synthetic air, the enthalpy of the injected fuel at 50 degrees Rankine, and the absolute value of the heat loss through the nozzle surfaces.

A side calculation of a fictitious constant pressure, zero-velocity combustor was made at 100 percent combustion efficiency with isentropic expansion to ambient pressure ( $p_0$ ) to obtain the combustor effectiveness.

The solution for static flow properties at the combustor stations involved the calculation of the velocity from the momentum equation, the mass flow per unit area from the continuity equation and the equation of state, the static enthalpy from the energy equation, and the arithmetic average of the measured inner- and outerbody static pressures. Before fuel injection, the static pressure was varied until the calculated mass flow per unit area matched its known value. After fuel injection, the arithmetic average of the static pressure was considered constant, and the combustor efficiency was varied until the calculated mass flow per unit area matched its known value. The details of the solution follow.



## 6.1 MOMENTUM EQUATION

The one-dimensional momentum equation was derived as

$$\begin{aligned}
 (wV/g)_x + (pA)_x &= (wV/g)_{x-1} + (pA)_{x-1} \\
 &+ \int_{x-1}^x p dA + k \int_{x-1}^x \frac{\partial}{\partial x} \left[ \int_{x_{le}}^x t e^{-1} p dA + (pA)_{BASE} \right]_{STRUTS} dx \\
 &+ \sum_i (w_{Fi} \cdot l_{VACFi} \cdot \cos \beta_i)_{x-1,x} \\
 &- 1/4 \left[ (wV/Ag)_x + (wV/Ag)_{x-1} \right] (\bar{C}_f \cdot A_w)_{x-1,x}
 \end{aligned} \quad (6.1)$$

where the subscript  $x$  denotes the current combustor station, and  $x-1$ , the previous station. The  $k$  in the fourth-term on the right of the equal sign was unity when calculating stations in the plane of the struts. Otherwise,  $k$  was equal to zero. The fifth-term was used to account for fuel momentum, and the sixth-term resulted from the integral

$$- \int_{x-1}^x q C_f \cos \delta_s dA_s$$

where  $q$  was the dynamic pressure,  $C_f$  the skin friction coefficient,  $\delta_s$  the angles of the combustor walls with respect to the  $x$ -axis and  $A_s$ , the surface area.

In equation 6.1, the first two terms on the left and right of the equal sign were combined with the sixth-term, and the velocity at the current station was obtained from

$$\begin{aligned}
 V_x &= (g/w_x) \left\{ \left[ 1 - (\bar{C}_f A_w)_{x-1,x} / 4A_{x-1} \right] (wV/g)_{x-1} \right. \\
 &+ \int_{x-1}^x p dA + (pA)_{x-1} - (pA)_x \\
 &+ k \int_{x-1}^x \frac{\partial}{\partial x} \left[ \int_{x_{le}}^x t e^{-1} p dA + (pA)_{BASE} \right]_{STRUTS} dx \\
 &\left. + \sum_i (w_{Fi} l_{VACFi} \cos \beta_i) \right\} / \left[ 1 + (\bar{C}_f A_w)_{x-1,x} / 4A_x \right]
 \end{aligned} \quad (6.2)$$



In the solution of  $V_x$  from equation 6.2,  $\bar{C}_{fx-1,x}$  was set equal to  $C_{fx-1}$  on the first iteration. Then  $C_{fx}$  was calculated, and

$$\bar{C}_{fx-1,x} = 0.5 (C_{fx} + C_{fx-1})$$

was used in subsequent iterations. Two passes were made from the strut leading to trailing edges. On the first pass, the base pressure in the third term of equation 6.2 was taken to be one-half the arithmetic average of the measured pressures at the strut trailing edge. On the final pass, the base pressure was calculated as a function of gamma and Mach number at the strut exit determined from the first pass through the struts (Reference 9).

## 6.2 CONTINUITY EQUATION AND EQUATION OF STATE

The mass flow rate at combustor stations was obtained from

$$w_x = w_o + \sum_i (w_{Fi})_{o,x} + \sum_i (w_{oi})_{o,x} \quad (6.3)$$

The mass flow per unit area was calculated from

$$(w/A)_x = w_x / A_x \quad (6.4)$$

and

$$(w/A)_x = (\rho V)_x \quad (6.5)$$

and the equation of state

$$\rho_x = (p/jRT)_x \quad (6.6)$$

where  $R_x$  is the universal gas constant divided by the molecular weight at  $x$ . Substituting equation 6.6 for  $\rho_x$  in equation 6.5 yields

$$(w/A)_x = (pV/jRT)_x \quad (6.7)$$

## 6.3 ENERGY EQUATION

The total and static enthalpy of the gaseous mixture in the combustor were obtained from

$$h_{Tx} = \left\{ w_o h_{To} + \sum_i \left[ (w_F h_{TF})_i + (w_o h_{To})_i \right] \right\}_{o,x} + Q_{o,x} / w_x \quad (6.8)$$

and

$$h_x = h_{Tx} - V_x^2 / 2gj \quad (6.9)$$



where  $w_F$  and  $w_O$  were the mass flow rates of injector and ignitor fuels and oxidants, and  $Q_{O,x}$  was the cumulative heat loss through the engine surfaces up to the station  $x$ .

#### 6.4 SOLUTION WITH NO FUEL INJECTED

The parameters  $V_x^{(1)}$ ,  $w_x$ ,  $(W/A)_x$ , and  $H_x^{(1)}$  were calculated from equations 6.2, 6.3, 6.4, 6.8 and 6.9, respectively. The initial estimate of static pressure ( $p_x^{(1)}$ ) was taken as the arithmetic average of measured inner- and outerbody pressures at station  $x$ . The HP problem was solved with the state variables  $p_x^{(1)}$ ,  $h_x^{(1)}$ , and  $(w/A)_x^{(1)}$  was calculated from equation 6.7. New estimates were obtained for  $p_x^{(n)}$ ,  $V_x^{(n)}$ ,  $h_x^{(n)}$ , and the HP problem was repeatedly solved until

$$\left| 1 - (w/A)_x^{(n)} / (w/A)_x \right| < \epsilon.$$

The initial estimate of total pressure was obtained from

$$p_{Tx}^{(1)} = p_x \left( 1 + \frac{\gamma-1}{2} M_x^2 \right)^{\frac{\gamma}{\gamma-1}}$$

and the SP problem was solved with the state variables  $p_{Tx}^{(1)}$ ,  $S_x$  to obtain  $h_{Tx}^{(1)}$ . New estimates were obtained for  $p_{Tx}^{(n)}$ , and the SP problem was repeatedly solved until

$$\left| 1 - h_{Tx}^{(n)} / h_{Tx} \right| < \epsilon.$$

#### 6.5 SOLUTION AFTER FUEL INJECTION

At this point, a new independent variable--the combustor efficiency--was introduced. The combustor efficiency was defined as

$$\eta_c = \frac{\text{weight of reacted hydrogen}}{\text{weight of injected hydrogen}}$$

In order to implement this concept of combustor efficiency, an inert hydrogen ( $HZ_2$ ) was introduced so that

$$\eta_c = \text{weight fraction of } H_2 \text{ (WFH}_2\text{)}$$

and

$$1 - \eta_c = \text{weight fraction of } HZ_2 \text{ (WFHZ}_2\text{)}.$$

The inert hydrogen was assigned the physical and thermodynamic properties of real hydrogen, but was not permitted to dissociate or to react with other species.



After fuel was injected in the combustor, the static pressure ( $p_x$ ) was fixed at the arithmetic average of the measured inner- and outerbody pressures. The parameters  $V_x$ ,  $w_x$ ,  $(w/A)_x$ ,  $h_{Tx}$  and  $h_x$  were calculated from equations 6.2, 6.3, 6.4, 6.8 and 6.9, respectively. The initial estimate of combustor efficiency ( $\eta_c^{(1)}$ ) was assumed equal to 0.50 at the combustor station where fuel was first injected or set equal to the converged value at the previous station for subsequent calculations. Each change in combustor efficiency required recalculation of the specific formula numbers of the elements in the fuel and mixture. The HP problem was solved for the chemical system defined by  $\eta_c^{(1)}$  with the state variables  $p_x$ ,  $h_x$  to obtain  $(w/A)_x^{(1)}$  (Equation 6.7). New estimates were obtained for  $\eta_c^{(n)}$ , and the HP problem was solved repeatedly until

$$\left| 1 - (w/A)_x^{(n)} / (w/A)_x \right| < \epsilon.$$

Total conditions were obtained in the same manner as in paragraph 6.4 with the combustor efficiency held equal to its converged value.

## 6.6 SONIC VELOCITY - COMBUSTOR THROAT

In the subsonic combustion mode, when the Mach number was less than 0.95 at the combustor throat, a side calculation was made to determine the value of combustor efficiency necessary to produce sonic velocity at the combustor throat. The calculation proceeded in the same manner as that in paragraph 6.5 with the exception that successive substitution of the calculated sonic velocity was made in equation 6.9 following each iteration.

## 6.7 REGENERATIVELY-COOLED ENGINE SIMULATION

The temperature of injected hydrogen was elevated during the tests to simulate the performance of a regeneratively-cooled engine. The accuracy of this simulation was determined by a recalculated total enthalpy at the combustor exit as

$$h_{Tr} = (w_o h_{To} + w_F h_{TF}^{50} + |Q_{NOZZLE}|) / (w_o + w_F)$$

where,  $h_{TF}^{50}$  was the enthalpy of hydrogen at 50 degrees Rankine, and  $Q_{NOZZLE} < 0$  was the heat loss in Btu/sec through the nozzle surfaces. The simulated conditions at the combustion exit were obtained by assuming that the total pressure and combustion efficiency were constrained to the values calculated at the actual combustor exit.

The total conditions were obtained from the chemical system defined by  $\eta_{c4}$  by solving the HP problem with the state variables  $P_{T4}$ ,  $h_{Tr}$  to obtain  $S_r$ . The initial estimate of static pressure,  $P_{4r}^{(1)} = P_4$ , was used with  $S_r$  and the chemical system defined by  $\eta_{c4}$  to solve the SP problem and obtain  $(w/A)_r^{(1)}$ . New estimates of  $P_r^{(n)}$  were obtained, and the SP problem was solved repeatedly until

$$\left| 1 - (w/A)_r^{(n)} / (w/A)_4 \right| < \epsilon.$$



## 6.8 FICTIVE COMBUSTOR

The conditions at the exit of a fictitious constant-pressure, zero-velocity combustor were determined at 100 percent combustor efficiency ( $\eta_{cf}$ ) with isentropic expansion to ambient pressure ( $p_o$ ) to obtain the combustor effectiveness ( $\eta_{ce}$ ). The state variables used to determine total conditions were  $p_{T2}$ , the total pressure at the inlet throat and  $h_{T4}$ , the total enthalpy at the actual combustor exit. The HP problem was solved with  $p_{T2}$ ,  $h_{T4}$  and the chemical system defined by  $\eta_{cf}$  to obtain  $S_f$ . The static conditions were determined by solving the SP problem with the state variables  $p_o$ ,  $S_f$ . The combustor effectiveness was calculated from

$$\eta_{ce} = \frac{(1 + f/a)lvac(po) - lvac2}{(1 + f/a)lvac'(po) - lvac2}$$

where  $f/a$  was the fuel-air ratio,  $lvac(po)$  was the vacuum specific impulse obtained by isentropically expanding the flow from the normal combustor exit to the ambient pressure ( $p_o$ ),  $lvac'(po)$  was the vacuum specific impulse obtained by isentropically expanding the flow from the fictive combustor exit to the ambient pressure, and  $lvac2$  was the vacuum specific impulse at the inlet throat.

## 7. NOZZLE

The nozzle performance was obtained by expanding the flow isentropically from the actual and regeneratively-cooled combustor exits, both to the nozzle exit area and to ambient pressure. The flow was also isentropically expanded from the normal combustor exit to those nozzle locations having static pressure taps in order to calculate the local skin friction coefficients. The nozzle vacuum stream thrust coefficient was obtained from the surface pressure integrals and friction drag on the nozzle walls, and the stream thrust (momentum) at the combustor and nozzle exits.

### 7.1 EXPANSION TO EXIT AREA

The mass flow per unit area was calculated from

$$(w/A)_6 = w_4/A_e$$

and the initial estimate for static pressure from

$$p_6^{(1)} = p_o$$

or

$$p_{6r}^{(1)} = p_o$$

The SP problem was solved with the state variables  $p_6^{(1)}$ , (or  $p_{6r}^{(1)}$ )  $s_4$  (or  $s_{4r}$ ) to obtain  $(w/A)_6^{(1)}$  (or  $(w/A)_{6r}^{(1)}$ ). New estimates were obtained for  $p_6^{(n)}$  (or  $p_{6r}^{(n)}$ ) and the SP problem was repeatedly solved until

$$1 - |(w/A)_{6r}^{(n)} / (w/A)_6| < \epsilon.$$

or

$$1 - |(w/A)_6^{(n)} / (w/A)_6| < \epsilon$$

### 7.2. EXPANSION TO AMBIENT PRESSURE

The SP problem was solved with the state variables  $p_o$ ,  $s_4$  (or  $s_{4r}$ ).



### 7.3 PERFORMANCE

The flow at the actual combustor exit was expanded isentropically to the measured nozzle pressures to obtain the skin friction coefficient, and hence, the friction drag on the nozzle surfaces. The friction drag was calculated from

$$FF_{\text{nozzle}} = \sum_i \bar{C}_{fi} \bar{q}_i \Delta A_{wi}$$

The nozzle vacuum stream thrust coefficient was calculated from

$$C_s = \left\{ F_4 + \int_{\text{NOZZLE}} p dA - F_{\text{NOZZLE}}^* + 2.84 K \frac{\partial}{\partial x} \left[ \int_{x_{1e}}^{x_{te}} p dx + (pA)_{\text{BASE}} \right] \right\} / F_6(A_e) \quad (7.1)$$

STRUTS

where  $K = 0$  for supersonic combustion,  $K = 1$  for subsonic combustion, and  $F_6(A_e)$  was the nozzle exit stream thrust from expansion to  $A_e$ .

The nozzle thrust coefficient was obtained from

$$C_T = (C_s w_4 \text{Ivac6}(A_e) - p_{o6} A_e) / F_6(p_o) \quad (7.2)$$

where  $\text{Ivac6}(A_e)$  denotes vacuum specific impulse obtained from isentropic expansion to  $A_e$ , and  $F_6(p_o)$  denotes stream thrust from isentropic expansion to  $p_o$ .

### 7.4 FICTIVE NOZZLE

The static and total conditions required to match the actual vacuum specific impulse at the nozzle exit plane were determined. The energy equations were

$$h_{T6'} = \left[ w_o h_{To} + \sum_i (w_{Fi} h_{TFi} + w_{oi} h_{Toi}) + Q_{o,6} \right] / w_4$$

and

$$h_{6'} = h_{T6'} - v_{6'}^2 / 2g_j \quad (7.3)$$

The actual vacuum specific impulse was

$$\text{Ivac6}' = C_s \cdot \text{Ivac6}(A_e)$$

and

$$\text{Ivac6}' = v_{6'} / g + p_{6'} A_e / w_4 \quad (7.4)$$





The independent variable for the system of equations was the static pressure,  $(p_{6'})$ . The dependent variable was  $(w/A)_6$ . The mass flow per unit area was defined as

$$(w/A)_6 = w_4/A_e$$

and

$$(w/A)_6^{(n)} = (pV/RT)_{6'}^{(n)} \quad (7.5)$$

The initial estimate for the static pressure was

$$p_{6'}^{(1)} = p_6(A_e)$$

The initial estimate of velocity was calculated from equation 7.4 as

$$v_{6'}^{(1)} = g (1/\text{vac}_{6'} - p_{6'}^{(1)} A_e/w_4)$$

and the static enthalpy from equation 7.3. The HP problem was solved with the state variables  $p_{6'}^{(1)}$ ,  $h_{6'}^{(1)}$  to obtain  $(w/A)_6^{(1)}$  from equation 7.5. New estimates were obtained for the static pressure, and the above procedure was repeated until

$$|1 - (w/A)_6^{(n)} / (w/A)_6| < \epsilon.$$

The initial estimate for the total pressure was calculated from the ideal-gas relationship

$$p_{T6'}^{(1)} = p_{6'} \left(1 + \frac{\gamma-1}{2} M_{6'}^2\right)^{\frac{\gamma}{\gamma-1}}$$

and the SP problem was solved to obtain  $h_{T6'}^{(1)}$ . The SP problem was repeatedly solved with new estimates of  $p_{T6'}^{(n)}$  until

$$|1 - h_{T6'}^{(n)} / h_{T6'}| < \epsilon.$$

Finally the flow at the actual combustor exit was expanded isentropically to the static pressure of the fictitious nozzle,  $p_{6'}$ . The SP problem was solved with the state variables  $p_{6'}$ ,  $S_4$  to obtain  $h_{4'}$ , and the nozzle kinetic energy and process efficiencies were calculated from

$$\eta_{KEN} = (h_{T6'} - h_{6'}) / (h_{T4} - h_{4'})$$

and

$$K_{DN} = (h_4 - h_{6'}) / (h_4 - h_{4'})$$

## 8. ENGINE PERFORMANCE

The internal performance was computed from both thrust measurement and from calculated momentum change through the engine. Three parameters were used to define the internal performance. These were the thrust ( $T_i$ ), the specific impulse ( $I_{si}$ ), and the thrust coefficient ( $C_{Ti}$ ).

### 8.1 CALCULATED INTERNAL PERFORMANCE

#### THRUST

$$T_i = F_{G1} - F_o - q_o A_c C_{DA} - P_o A_c (1 - A_o/A_c) \quad (1bf)$$

#### SPECIFIC IMPULSE

$$I_{si} = T_i / w_F \quad (1bf \text{ sec/lbm})$$

#### THRUST COEFFICIENT

$$C_{Ti} = T_i / (q_o A_c)$$

### 8.2 MEASURED INTERNAL PERFORMANCE

#### THRUST

$$T_i = F_c / \cos \alpha + D_{EXT} \quad (1bf)$$

where  $F_c$  was the corrected load cell force (Reference 9, pp 27 ),  $\alpha$  was the angle of attack, and

$$D_{EXT} = \left[ \int p dA - \int C_f q \cos \delta_s dA_s \right]_{\text{OUTER COWL}}$$

#### SPECIFIC IMPULSE

$$I_{si} = T_i / w_F \quad (1bf \text{ sec/lbm})$$

#### THRUST COEFFICIENT

$$C_{Ti} = T_i / (q_o A_c)$$



## 9. DESCRIPTION OF PERFORMANCE OUTPUT

Performance output has not been published as yet, however, NASA-Langley Research Center is compiling this data and the release of their results is pending. This section defines parameters used in test summary reports previously issued to NASA.

Each page of the performance output (computer printout) has a standard heading with reading number (test number), block number (numbered sequentially and corresponding to recorded times of test data), time (of data recording from start of test in seconds), Mach number, PT (total pressure in wind tunnel in psia), TT (total temperature in wind tunnel in degrees Rankine) and page numbers. Pages 1, 2 and 3 of the computer printout contains the Summary Report of flow parameters at each calculation station in the AIM. Each station is headed by a station designator (i.e., wind tunnel, inlet throat, combustor, etc.) followed by 3 integers (the additional zero following the combustor designator is meaningless).

The first integer denotes the station number, the second denotes the combustor station number and the third denotes the number of iterations required to converge on a solution. The third integer may assume values between 0-21, 100-121 and 200-221. A value of the third integer equal to 21, denotes that the mass flow was too great (or the flow area too small) to obtain a solution, 121 denotes that the solution for total conditions did not converge in 21 iterations and 200-221 denotes that the mass flow was too small (or the flow area too large) to obtain a solution. When both solutions for static and total conditions have converged, the third integer may assume the values 1-20 or 101-120, depending on which solution (static or total) required the larger number of iterations.

Most of the station designators are self-explanatory. The first appearance of the designators 'Wind Tunnel' and 'Spike Tips NS' (NS = NORMAL SHOCK) reports conditions in wind tunnel and upstream of the spike tip based on a wind tunnel Mach number determined from calibration runs. The second appearance of these designators reports conditions based on a wind tunnel Mach number calculated from the wind tunnel total pressure and temperature and the spike tip pitot pressure applied to the normal shock equations. The designators 'INLET UPNRSK' and 'INLET DNNRSK' denote conditions upstream and downstream of a normal shock positioned at a fictitious flow area 1.10 times the flow area at the inlet throat. The designator 'COMBUSTOR REGEN' denotes conditions at the combustor throat simulating a regeneratively-cooled ramjet. 'NOZZLE AE' and 'NOZZLE PO' report conditions when the flow was expanded isentropically to the nozzle exit area and to the wind tunnel static pressure, respectively. 'FICTIVE COMBUSTOR' denotes conditions in a zero-velocity, constant-pressure combustor with combustor efficiency equal to unity. 'FICTIVE NOZZLE' reports conditions required to match the actual momentum and nozzle exit area.



Definition and units of parameters in the Summary Report (pp 1-3) are listed below:

P - pressure, psia  
 T - temperature, °R  
 H - enthalpy\*, Btu/lbm  
 GAMMA - specific heat ratio  
 MOLWT - molecular weight  
 SONV - sonic velocity, ft/sec  
 MACH - Mach number  
 VEL - flow velocity, ft/sec  
 S - entropy, Btu/lbm-°R  
 W/A - flow rate per unit area, lbm/sq in.  
 W - flow rate, lbm/sec  
 A/AC - local area ratio  
 MOMTM - flow momentum, lbf  
 Q - dynamic pressure, lbf/sq in.  
 IVAC - vacuum specific impulse, lbf-sec/lbm  
 PHI - equivalence ratio  
 ETAC - combustor efficiency

Definitions and units of parameters on pages 4 and 5 follow:

XABS - axial distance from virtual spike tip, in.  
 P-IB - surface pressure on innerbody, psia  
 P-OB - surface pressure on inner cowl, psia  
 PDA - pressure integral,  $\int_0^x p dA$ , lbf

\*Two values were reported. The first value was the JANNAF-based enthalpy. The value in parenthesis was the enthalpy potential or the sensible enthalpy based on the equation

$$\sum_i \left[ \int_0^T c_{p_i} dT \sigma_i(T) \right] = \sum_i \left[ \left( H_{fi}^{298} + \int_{298}^T c_{p_i} dT \right) \sigma_i(T) \right]$$

$$- \sum_i \left[ \left( H_{fi}^{298} + \int_{298}^{300} c_{p_i} dT \right) \sigma_i(T) \right] + \sum_i \left( \int_0^{300} c_{p_i} dT \sigma_i(T) \right)$$

QOX - cumulative internal heat loss from spike tip to station x, Btu/sec

Q-IB - cumulative internal heat loss from innerbody, Btu/sec

Q-OB - cumulative internal heat loss from outerbody, Btu/sec

CAWALL - cumulative surface area, sq in.

P-IB/PS0 - innerbody static to wind tunnel static pressure ratio

P-IB/PT0 - innerbody static to wind tunnel total pressure ratio

P-OB/PS0 - outerbody static to wind tunnel static pressure ratio

P-OB/PT0 - outerbody static to wind tunnel total pressure ratio

Definition and units of parameters on page 6 follows:

X - axial distance from spike virtual tip

DDRAG - incremental frictional drag force, lbf

CDRAG - cumulative frictional drag force, lbf

CF - skin friction coefficient

HC - heat transfer coefficient, Btu/(sec-sq ft-°R)



## 10. COMPUTER PROGRAM OPERATION

The AIM data-reduction computer program was designed to operate interactively on the IBM 360-67 dual processor at the NASA - Lewis Research Center.

An IBM 2741 typewriter terminal was used to execute the data-reduction program, and COPE 1200 series remote batch terminals\* were used to print the performance output.

Numerous procedures were written to facilitate loading the programs, modifying the calibration data and recording channel assignments, removing defective recording channels, assigning the injector and igniter configurations and valving, and specifying certain test parameters such as angle-of-attack, subsonic combustion and heat-transfer data.

The procedure used to assign program libraries and logical units to the system and to load the programs is reproduced in Table 10-1.

The names of the program libraries follow the procedure name 'JOB LIB' which assigned the libraries to the system (line 200 - 1400, Table 10-1). The contents of the program libraries which include module and entry point names, were reproduced in Appendix A.

The next three lines (1500-1700) in Table 10-1 loaded the block data subroutines PSBLK70, BDEN35 and BDCN49 which contain the pressure recording channel assignments, the test configuration data and the calibration data, respectively. These subroutines must correspond to the Reading number (test) being reduced prior to evoking 'HRERUN5' as shown in Table 10-2.

The remainder of the procedure 'HRERUN5' assigned the FORTRAN logical units to the system and loaded and initialized the data reduction program.

Other procedures used to facilitate execution of the data reduction program were:

- (1) PSXX - used to modify the pressure recording channel assignments in the block data subroutines PSBLKYY
- (2) SETXX- used to modify the calibration data in the block data subroutines BDCNYY with the exception of SET34, which was used in all executions

\*The COPE terminals were programmed to emulate an IBM 2780 terminal.



TABLE 10-1

## PROCEDURE 'HRERUN5'

```

HRERUN5 0000000 PROCDEF HRERUN5
HRERUN5 0000200 JOBLIB D36CLIB,10
HRERUN5 0000300 JOBLIB DATASYS.DATSYS,20
HRERUN5 0000400 JOBLIB LNKBB3,30
HRERUN5 0000500 JOBLIB GPMLIB9$,40
HRERUN5 0000600 JOBLIB DATASYS.VINCE,50
HRERUN5 0000800 JOBLIB NEWNEW,70
HRERUN5 0000900 JOBLIB TESTCD1,80
HRERUN5 0001000 JOBLIB VINCENEW,90
HRERUN5 0001100 JOBLIB VINNEW2,100
HRERUN5 0001200 JOBLIB DATASYS.DAN,110
HRERUN5 0001300 JOBLIB TESHRE,120
HRERUN5 0001400 JOBLIB NEWLIB,130
HRERUN5 0001500 LOAD PSBLK70;DISPLAY 'BLOCK DATA LOADED: PSBLK70'
HRERUN5 0001600 LOAD BDEN35;DISPLAY 'BLOCK DATA LOADED: BDEN35'
HRERUN5 0001700 LOAD BDCN49;DISPLAY 'BLOCK DATA LOADED: BDCN49'
HRERUN5 0001800 LOAD ADATA; DISPLAY 'BLOCK DATA LOADED: ADATA'
HRERUN5 0001900 LOAD NGAS3; DISPLAY 'BLOCK DATA LOADED: NGAS3'
HRERUN5 0002000 DDEF FT5CF001,VS,BIG
HRERUN5 0002100 DDEF FT6CF001,VS,PRT5,RET=T
HRERUN5 0002200 DDEF FT66F001,VS,PRT1,RET=T
HRERUN5 0002300 DDEF FT06F001,VS,ERR,RET=T
HRERUN5 0002400 DDEF FT18F001,VS,JUNK1
HRERUN5 0002500 DDEF FT17F001,VS,PRT3
HRERUN5 0002600 DDEF FT04F001,VS,TSTFIL
HRERUN5 0002700 DDEF FT99F001,VS,GMESS,RET=T
HRERUN5 0002800 LOAD TSKTSK; DISPLAY 'TSKTSK LOADED'
HRERUN5 0002900 QUALIFY HMAIN
HRERUN5 0003000 HMAIN
HRERUN5 0003100 QUALIFY GETHRE
HRERUN5 0003200 SET DSNAME.(0,6)='HREFDG',NCHNDS=6
HRERUN5 0003300 QUALIFY RDHIGH
HRERUN5 0003400 SET NBLOCK=C
HRERUN5 0003500 DDEF FT25F001,VS,TAPE.BINEQ
HRERUN5 0003600 DDEF FT29F001,VS,FILE,RET=T
HRERUN5 0003700 DDEF FT35F001,VS,TAPE.BINTR
HRERUN5 0003800 DDEF FT15F001,VS,VINCERR,RET=T

```



TABLE 10-2

BLOCK DATA SUBROUTINES VS READING NUMBER

BDCN30 - READING NUMBERS THRU 33  
 BDCN34 - READING NUMBERS 34 & 35  
 BDCN36 - READING NUMBERS 36 THRU 48  
 BDCN49 - READING NUMBERS 49 THRU 62  
 BDCN63 - READING NUMBER 63  
 BDCN64 - READING NUMBER 64  
 BDCN65 - READING NUMBERS 65 THRU 69  
 BDCN70 - READING NUMBERS 70 THRU 75  
 BDCN76 - READING NUMBERS 76 THRU 92  
 BDCN93 - READING NUMBERS 93 THRU 96  
 BDCN97 - READING NUMBER 97 ONLY  
  
 BDEN30 - READING NUMBERS THRU 33  
 BDEN34 - READING NUMBER 34  
 BDEN35 - ALL OTHER MACH 6 READING NUMBERS  
 BDEN70 - MACH 6 AT ANGLE OF ATTACK &  
           MACH 7 UP TO READING NUMBER 70  
 BDEN76 - ALL OTHER MACH 7 READING NUMBERS  
 BDEN93 - ALL MACH 5 READING NUMBERS  
  
 PSBLK17 - READING NUMBERS THRU 35  
 PSBLK36 - READING NUMBERS 36 THRU 48  
 PSBLK65 - READING NUMBERS 65 THRU 69  
 PSBLK70 - READING NUMBERS 49 THRU 64 & 70 ON UP

- (3) COXX - used to remove defective recording channels and to assign the mass flow rates of nitrogen and oxygen for each Reading number (XX)
- (4) TCXX-ZZZ - used to assign injector, ignitor and valving configurations for each block number (ZZZ) of each Reading number (XX). This procedure was also used to assign heat transfer data in Reading numbers 33 through 69.

A cross reference of the required block data subroutines and procedures versus Reading numbers was prepared in Tables 10-3, 10-4 and 10-5 for the Mach 5, 6 and 7 tests, respectively. Three additional procedures were written to change line numbers 1500 through 1700 of the procedure 'HRERUN5' in Table 10-1. These were 'CHGPSBLK', 'CHGBDEN' and 'CHGBDCN' which, when appended by a space plus a double digit, changed the name of the appropriate block data subroutine to be loaded. For example, the entry

chgbdcn 63

changed line 1700 in Table 10-1, and caused the line

HRERUN5 0001700 LOAD BDCN63;DISPLAY 'BLOCK DATA LOADED: BDCN63'





TABLE 10-3  
MACH 5 TESTS

READING	PSBLKXX	BDENXX	BDCNXX	PSXX	SETXX	COXX	TCXX-ZZZ
93	70	93	93	89	34	93	TC93-BLKNO
94	70	93	93	89	34	94	TC94-BLKNO
95	70	93	93	89	34	95	TC95-BLKNO
96	70	93	93	89	34, 96	96	TC96-BLKNO
97	70	93	97	92	34	97	TC97-BLKNO

TABLE 10-4  
MACH 6 TESTS

READING	PSBLKXX	BDENXX	BDCNXX	PSXX	SETXX	COXX	TCXX-ZZZ
71	70	70	70	71	34	71	TC71-BLKNO
69	65	35	65	92	34	69	TC69-BLKNO
65	65	35	65	92	34	65	TC65-BLKNO
64	70	35	64	71	34	64	TC64-BLKNO
63	70	35	63	71	34	63	TC63-BLKNO
61	70	35	49	71	34, 61	61	TC61-BLKNO
60	70	35	49	71	34, 61	60	TC60-BLKNO
57	70	35	49	71	34, 61	57	TC57-BLKNO
54	70	35	49	71	34, 61	54	TC54-BLKNO
52	70	35	49	71	34, 61	52	TC52-BLKNO
38	36	35	36	--	34, 38	38	TC38-BLKNO
36	36	35	36	--	34	36	TC36-BLKNO
34	17	34	34	--	34	34	TC34-BLKNO
33	17	30	30	--	34	33	TC33-BLKNO

TABLE 10-5  
MACH 7 TESTS

READING	PSBLKXX	BDENXX	BDCNXX	PSXX	SETXX	COXX	TCXX-ZZZ
88	70	76	76	92	34, 88	88	TC88-BLKNO
89	70	76	76	89	34, 89	89	TC89-BLKNO
90	70	76	76	89	34, 89	90	TC90-BLKNO
91	70	76	76	89	34, 91	91	TC91-BLKNO
92	70	76	76	92	34, 92	92	TC92-BLKNO



to be printed on the typewriter terminal. A list of all procedure names was reproduced in Table 10-6, and the contents of the applicable procedures were included in Appendix B.

In order to illustrate the usage of Tables 10-3, 10-4 and 10-5 in reducing the data, the procedure 'HRERUN5' was changed and loaded to process the data for Reading No. 93 by evoking the following procedures: (see line 1 of Table 10-3):

```
chgpsblk 70
chgbden 93
chgbdcn 93
hrerun5
```

The first three procedures changed lines 1500 through 1700 in Table 10-1 to correspond to the block data subroutines on the first line in Table 10-3, and the last procedure loaded the data-reduction program. After loading the program, the computer prompted the user for the 'INPUT LINE DSNAME' which was 'rdg50' for all readings. Next the user entered

```
release ft66fool (only if the user wanted to print performance output on
                  the typewriter)
```

```
ps89
set34
grabber 93
co93
tc93-039
```

corresponding to the first line of Table 10-3 to process Block 039 of Reading 93. The procedure 'grabber 93' retrieved the raw data for Reading 93 from migrated storage into a temporary library called 'YHTFX2-T001', and the computer was ready to start processing the data. Some of the above procedures contained program control system (PCS) commands, each of which was assigned a unique number printed at the terminal. After processing Block 039 and before processing Block 048 of Reading 93, the PCS number (0013) printed following the procedure 'tc93-039' was removed, and the program was prepared to process Block 048 by the following entries:

```
remove 13
tc93-048
```

After processing all of the desired blocks in Reading 93, the data reduction program was unloaded and reloaded by the following commands:

```
abend
hrerun5
```



## TABLE 10-6

## PROCEDURE NAMES

AIMFINAL	BL57	BL69	BORED	CDINJ	CHGBDCN	CHGBDEN	CHGPSBLK
CHGTC	CKAREA	COMACH5	COPYMEMB	CO33	CO34	CO36	CO38
CO52	CO54	CO57	CO60	CO61	CO63	CO64	CO65
CO69	CO71	CO88	CO89	CO90	CO91	CO92	CO93
CO94	CO95	CO96	CO97	CPL0C	CP02	DELET	DRG
DSS	FINALAIM	FIXDRG	FIX61	FIX64	FIX65	GASCAL	GONHOME
GRABBER	GRABBERP	HRERUN5	HRERUN6	INLTSYM5	INLTSYM6	INLTSYM7	JOBLIB
KDOSEL	LAZY	LNGPRT	LOADCELL	LSTC	LSTCO	LSTP	MACH5
MACH6	MACH7	MIGDS	MOVIES	PC	PDAOB	PRIN	PRLS
PRNT	PRNTMV	PS71	PS89	PS92	PUKE1	PUKE2	PUKE2P
PUSH	PUTIN	RUBOUT	SETCMB	SETDRG	SETENG	SETFLOAD	SETFTEMP
SETNOZ1	SETPS	SETSONIC	SETSTD	SETTM4	SETTOPT	SET34	SET38
SET61	SET88	SET89	SET91	SET92	SET96	SHOWVAL	STOW
STRUT	TC33-083	TC33-121	TC33-129	TC33-136	TC34-075	TC34-079	TC34-082
TC34-131	TC34-168	TC34-184	TC36-085	TC36-091	TC36-100	TC36-113	TC36-129
TC36-145	TC38-067	TC38-079	TC38-086	TC38-089	TC38-090	TC52-069	TC52-076
TC52-085	TC52-095	TC54-066	TC54-098	TC54-105	TC54-115	TC54-139	TC54-154
TC54-174	TC54-204	TC57-078	TC57-092	TC57-122	TC57-156	TC57-181	TC60-055
TC60-080	TC60-089	TC60-107	TC60-130	TC60-138	TC60-150	TC60-159	TC60-169
TC60-176	TC61-088	TC61-110	TC61-118	TC61-125	TC61-136	TC61-146	TC61-160
TC61-163	TC61-169	TC61-181	TC61-193	TC63-064	TC63-071	TC63-098	TC63-134
TC63-163	TC64-058	TC64-071	TC64-109	TC64-151	TC64-175	TC64-211	TC65-060
TC65-072	TC65-078	TC65-096	TC65-102	TC65-120	TC65-139	TC69-069	TC69-071
TC69-087	TC69-095	TC69-099	TC69-110	TC69-126	TC69-159	TC69-169	TC71-059
TC71-071	TC71-075	TC71-096	TC71-111	TC71-153	TC71-157	TC71-177	TC71-181
TC71-197	TC71-198	TC88-131	TC88-141	TC88-159	TC88-168	TC88-169	TC88-170
TC88-178	TC88-186	TC88-201	TC88-208	TC89-070	TC89-094	TC89-106	TC89-114
TC89-119	TC89-130	TC89-136	TC89-143	TC89-155	TC89-183	TC90-082	TC90-092
TC90-099	TC90-104	TC90-119	TC90-124	TC90-137	TC90-138	TC91-074	TC91-079
TC91-086	TC91-090	TC91-105	TC91-119	TC91-128	TC91-131	TC91-134	TC91-141
TC92-076	TC92-097	TC92-121	TC92-144	TC92-191	TC92-216	TC93-039	TC93-048
TC93-057	TC93-066	TC93-071	TC93-084	TC93-093	TC94-033	TC94-040	TC94-051
TC94-059	TC94-066	TC94-084	TC94-122	TC94-123	TC94-127	TC94-141	TC94-143
TC94-144	TC95-032	TC95-044	TC95-066	TC95-076	TC95-099	TC95-106	TC95-115
TC95-123	TC95-130	TC95-142	TC95-156	TC95-169	TC95-210	TC95-233	TC95-241
TC96-034	TC96-042	TC96-052	TC96-069	TC96-076	TC96-085	TC96-156	TC96-178
TC96-190	TC96-191	TC96-212	TC96-233	TC97-029	TC97-052	TC97-057	TC97-081
TC97-102	TC97-128	TC97-159	TC97-180	TC97-207	TC97-231	TC97-236	TC97-240
TH20	TIME	TUNNOPT	TURKEY	UPDLIB	WIPEOUT	XREF	ZLOGON



and the entries;

ps89

set34

grabber 96

set96

co96

tc96-034

prepared the program to process Block 034 of Reading 96. A typewriter print-out of an execution of Blocks 107 and 130 of Reading 60 was reproduced in Appendix C.

The dates of the final performance output versus reading and block numbers is presented in Table 10-7.



TABLE 10-7

## FINAL PERFORMANCE OUTPUT VS DATE

READING-BLK1, BLK2, ETC

DATE

33-ALL(SPIKE PRESSURE < 0, NO OUTPUT)	DECEMBER 23, 1974
34-075, 079, 082, 131, 168, 184	"
36-085, 091(NOZZLE PRESSURE < 0, NO OUTPUT)	"
36-100, 113, 129, 145(FUEL PRESSURE = 0)	"
38-067, 086(SPIKE PRESSURE < 0, NO OUTPUT)	"
38-079, 089, 090(FUEL PRESSURE = 0)	"
52-069, 076, 085, 095	MARCH 05, 1975
54-066, 098, 115, 139, 154, 174, 204	"
54-105	JANUARY 20, 1975
57-078, 092, 122	MARCH 04, 1975
57-156, 181	JANUARY 29, 1975
60-055, 080, 089, 107, 130, 138, 150	MARCH 04, 1975
60-159	MARCH 21, 1975
60-169, 176	JANUARY 29, 1975
61-088, 110, 118, 125, 136, 146, 160, 163, 169, 181, 193	MARCH 04, 1975
63-064	APRIL 14, 1975
63-071, 098, 134, 163	MARCH 03, 1975
64-058, 109, 175	"
64-071	JANUARY 16, 1975
64-151, 211	JANUARY 20, 1975
65-060, 072, 078, 096, 102, 120, 139	MARCH 03, 1975
69-069, 071, 095, 110, 159, 169	"
69-087, 099, 126	JANUARY 29, 1975
71-059, 071, 075, 096, 111, 153, 177, 197, 198	MARCH 03, 1975
71-066, 157, 181	JANUARY 29, 1975
88-131, 141, 159, 168, 169, 170, 178, 186, 195, 201, 208	FEBRUARY 12, 1975
89-070, 094, 106, 114, 119, 130, 136, 143, 155, 183	FEBRUARY 13, 1975
89-143, 155(PRESSURE INPUT, CHANNELS 123, 206, 270, 273)	MARCH 06, 1975
90-082, 104, 124, 137, 138	DECEMBER 20, 1974
90-092, 099, 119	JANUARY 27, 1975
91-074, 079, 086, 090, 105, 119, 128, 131, 134, 141	FEBRUARY 13, 1975
92-076, 097, 121, 144, 191, 216	JANUARY 07, 1975
93-039, 048, 057	MARCH 02, 1975
93-066, 071, 084, 093	MARCH 03, 1975
94-033, 040, 122, 123, 127	FEBRUARY 28, 1975
94-051, 066, 084	JANUARY 27, 1975
94-059	JANUARY 17, 1975
94-141, 143, 144	MARCH 02, 1975
95-032, 044, 066, 076, 099, 106, 115, 123, 130, 142, 156, 169, 210, 241	FEBRUARY 28, 1975
95-233	JANUARY 27, 1975
96-034, 212	MARCH 28, 1975
96-042, 052, 069, 076, 085, 156, 178, 190, 191, 233	FEBRUARY 27, 1975
97-029, 052, 057, 081, 102, 128, 159, 180, 207, 231, 236, 240	"



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## APPENDIX A

### PROGRAM LIBRARIES

The following tables list the module and entry point names in the AIM data-reduction program libraries.



# APPENDIX A

## TABLE A-1 D360LIB (LIBRARY)

D360LIB  
 SMSEARCH  
   SMSEAR#P, SMSEAR#C, SEARCH  
 GATES  
   TRMWAR , TRMWR , GATES#P , TRMRD , GATES#C  
 TAGXXX  
   TAGG , TAG , TAGXXX#P, NTAGG , TAGXXX#C  
 SMCENT  
   SMCENT#P, CENT , SMCENT#C  
 GETDATA  
   GETDAT , GETDAT#P, GETDAT#C  
 LINEXX  
   WRITEL , READL , ERRLINE , UPDATE , OPEN , CLOSE , LINEXX#P, DELETE  
   LINEXX#C  
 LDNL\$  
   LODLB\$ , LODNM\$ , LDNL\$#P , LDNL\$#C  
 SMARITH  
   SMARIT#P, ARITH , SMARIT#C  
 INTCNVXX  
   INTCNV , INTCNV#P, INTCNV#C  
 SMEQUNAM  
   SMEQUN#C, SMEQUN#P, EQUNAM  
 ERMSG\$  
   ERMSG4 , ERMSG1 , ERMSG3 , ERMSG2 , ERMSG\$#P, ERMSG\$#C  
 NEWDYN  
   DYNRES , DYNPRT , NEWDYN#P, DYNPRE , NEWDYN#C  
 OUTJMS  
   OUTJB\$ , OUTJM\$#P, OUTJM\$#C  
 SMCONVC  
   CONVC , SMCONV#C, SMCONV#P  
 SMDATA  
 PCSXXX  
   CC , BEGIN , SHUTF5 , OPENF5 , PCS  
 REGIST  
   REGIST#C, REGIST#P  
 STRMD\$  
   CST\$ , CST\$#C , CST\$#P  
 CNVXXX  
   CNVRT , CNVPTR , UNFLAG , CNVCH\$ , CNVXXX#C, SAVRES , CNVXXX#P  
 NEWTRM  
   NEWTRM#C, NEWTRM#P  
 SMERMES  
   SMERME#C, SMERME#P, ERMES  
 CONVRX  
   CONVRT , CONVRX#C, CONVRX#P  
 LINKAG  
   LINKAG#C, LINKAG#P  
 SMCTRL  
   SMCTRL#C, SMCTRL#P  
 STNLS  
   STRNM\$ , CLRLB\$ , BLDNM\$ , STRLB\$ , CLRN\$ , BLDLB\$ , STNLS#C , STNLS#P  
 SMDIMENS  
   SMDIME#P, SMDIME#C, DIMENS  
 MOLOC\$  
   COLOC\$ , OLOC\$ , QOLOC\$  
 SMLINEIN  
   SMLINE#C, SMLINE#P, INI , LINEIN  
 GETNAMXX  
   GETNAM#P, STORED , GETFUN , GETNAM#C, GETNAM , GEDATA , UPSETA , SETUP  
   UPSET  
 MOVEXX  
   MOVEXX#P, MOVEXX#C, MOVE  
 GETSAVE  
   GETSAV#P, GETSAV#C, GETSAV  
 HASH





# APPENDIX A (Con't)

## TABLE A-1 (Con't)

HASH#P ,HASH#C ,GNHSEN  
 HSHD  
 HSH#P ,HSH#C ,HSH  
 SMICHANG  
 SMICHA#C,ICHANG ,SMICHA#P  
 PT13RH  
 PT13RH#P,PT13RH#C,PR13TK ,PR13MV  
 SMGETINT  
 GETINT ,SMGETI#C,SMGETI#P  
 RESOXX  
 RESOLV ,RESOLV#C,RESOLV#P  
 TMAIN  
 TMAIN#P ,TMAIN#C  
 LDTAB\$  
 LDTAB\$#P,LDTAB\$#C,LDTB\$  
 PACKIT  
 PACKLN ,PACKIT#P,PACKIT#C  
 LINKUP  
 LINKUP#P,LINKUP#C  
 RDAUP  
 RDAUP#P ,INIRD ,SETBCK ,RDAUP#C ,RDUNPK  
 INVOXX  
 INVOKE#C,INVOKE#P,INVOKE  
 COUPLE  
 CUCNTK ,CUCNMV ,COUPLE#C,COUPLE#P,FECNTK ,FECNMV ,CHALTK ,CHALMV  
 CHCNTK ,CHCNMV  
 RELTIMXX  
 RELTIM#C,RELTIM#P,RELTIM ,JULIAN  
 LNKWXX  
 LNKWXX#C,LNKWXX#P,LINKWR  
 UNPK  
 SEPSGN ,CNCTSP ,UNPK#C ,UNPK#P ,UNPKIT ,CMBSGN ,INUNPK ,CNCTPK  
 CLMFMT  
 CLMF ,CLMFMT#C,CLMFMT#P,FPTOAF ,INTOAF ,AFTOAF  
 SMFLINE  
 SMFLIN#C,FLINE ,SMFLIN#P  
 ENTIXX  
 ENTIXX#C,ENTIXX#P,ENTITY ,THREAD  
 SMSENTER  
 SMSENT#P,SENDER ,SMSENT#C  
 SMVENTER  
 VENTER ,SMVENT#P,SMVENT#C  
 ITO  
 ITO#C ,ITO#P ,ITO#BC  
 RDLNDS  
 RDLNDS#C,SETLB ,ACCP ,CLOSOU ,RDLINE ,OUDSPR ,LNDSPR ,SETSP  
 WRLINE ,CLOSIN  
 HSHD\$  
 HSH\$#C ,HSH\$#P ,HSH\$

**APPENDIX A (Con't)**  
**TABLE A-2 DATASYS.DATSYS**  
**(LIBRARY)**

DATASYS.DATSYS  
 TSKTSK  
   TSKTSK#P,TSKTSK#C  
 GATES  
   TRMWAR ,TRMWR ) ,GATES#P ,TRMRD ,GATES#C  
 NUBASK  
   NUBASK#P,NUBASK#C  
 DISPLY  
   DEMCAD ,DISPLY#P,DISPLY#C  
 SCNVAL  
   SCANV ,SCNVAL#P,SCNVAL#C  
 FNCL  
   FCALL ,FLOAD ,FLODED ,FNCL#P ,FNCL#C  
 BLDOUT  
   OUTCNV ,BLDOUT#P,BLDOUT#C  
 PLATS  
   PLAT ,PLATS#P ,PLATS#C  
 CONBCD  
   CNCVRT ,CONBCD#P,CONBCD#C  
 READER  
   DDEFLN ,XMAS ,RDLIN ,DONER ,RD ,DDEFRD ,RDRES ,PUNKIN  
   RW  
 DUMPIT  
   DUMPIT#P,DUMPIT#C  
 FERROR  
   SETAD ,CALERC ,CALERR ,GETERR ,CALERM  
 NOBLER  
   NOBLE ,NOBLER#P,NOBLER#C  
 TESBLD  
   TESBLD#C,TESBLD#P  
 QUTFDG  
   QUTEKE ,QUTFDG#C,QUTFDG#P  
 TSTDYN  
   TSTDYN#C,TSTDYN#P  
 CADRED  
   RDCA\$ ,RDCADP ,DELRD\$ ,SRTMB\$ ,RDCADC ,RDCADE  
 NMHASH  
   ENTHSH ,HASHC ,HASH ,REMHSB ,HASHP  
 CFRDWR  
   RDCFP ,RDCFC ,WRCFDS ,RDCFDS  
 OPTION  
   OPTION#P,OPTION#C  
 BATCH  
   BATCH#P ,BATCH#C  
 SCNCHK  
   SCNCHK#P,SCNCHK#C,SCANCK  
 COLOUR  
   COLOUR#P,COLOR ,COLOUR#C  
 SQCP  
   SQCP#P ,SQCP#C  
 ENTRCF  
   ENTRCF#P,BLDCOF ,ENTRCF#C  
 COUPLE  
   CUCNTK ,CUCNMV ,COUPLE#C,COUPLE#P,FECNTK ,FECNMV ,CHALTK ,CHALMV  
   CHCNTK ,CHCNMV  
 DUMPAL  
   DUMPAL#C,DUMPAL#P  
 CPCONV  
   INCVRT ,CPCONV#C,CPCONV#P  
 EXPLAN  
   EXPLAN#C,EXPLAN#P,EXPL  
 PDPSND  
   PEESECT ,PDPW ,DLWPD  
 THERMO  
   THERMO#C,THERMO#P,THERM  
 GNTANK  
   GNTANK#C,DAMPER ,GNTANK#P  
 CADINT  
   CADINT#C,CADINT#P,RDRAWD  
 TISKET  
   TISKET#C,TISKET#P  
 CPCNVR  
   CPCNVR#C,FSTENG ,CPCNVR#P  
 ERTST  
   ERTST#C ,ERTST#P



# APPENDIX A (Con't)

## TABLE A-3 LNKBB3 (LIBRARY)

LNKBB3  
CALFAK  
    OFFSET ,SYMBOL ,CALFAK#P,QUWAA3 ,PLOT ,QUFILL ,DEVOUT ,CALFAK#C  
MLINER  
    MLINER#P,MLINER#C  
MRLOWW  
    LRLOWW ,MRLOWW#P,MRLOWW#C  
MRTTXX  
    LRTY37 ,LRTY35 ,LRASIZ ,LR2741 ,LRBSIZ ,LRTTXX ,LRPAUX ,MRTTXX#P  
    LRPURG ,MRTTXX#C  
MRCC88  
    LRCC88 ,PRCC88 ,OPEN88 ,CRCC88 ,RDCC88 ,CLOS88  
PDFFAK  
    PDPW ,PDFFAK#C,PDPFAK#P  
PLOTS  
    LSP ,PLOTS#C ,PLOTS#P  
FLINER  
    FLINER#C,FLINER#P  
MRLIST  
    LRLIST ,MRLIST#C,MRLIST#P  
GROUPT  
    GROUPT#C,GROUPT#P  
MLOGXY  
    LOGXY ,MLOGXY#C,MLOGXY#P  
MRCT94  
    MRCT94#P,MRCT94#C,ACCT94  
FLOSH  
    FLOSH#P ,FLOSH#C  
LINK3  
    LRTPF8 ,LRION ,MRZIPP#P,MSCRAM#C,LRLGER ,LRTMF8 ,MRTMF8 ,MRCPLT#P  
    KANBALL ,CWTC ,MRFILM ,RASTER ,LRCLER ,MRFLET#C,MRINTR#P,LRGG94  
    LRAXIS ,LRID ,LRAON ,LRMOFF ,FILM ,MRWTCC ,LRLABL ,LRNOFF  
    LRCHSZ ,LRCON ,MRSCLR#P,MRTSF8#C,MRTSGA ,MRTSG8#C,LRBON ,PER  
    PASTER ,KBERG ,LREON ,LRWTC ,LRDON ,LRSIZE ,MRTVF8#C,LRTSGA  
    MESSER ,LRCUT ,LRLEGN ,MRLABL ,MRSPIL#P,LRGON ,LRKOFF ,CID  
    LRLOFF ,MRRGON ,MRCPLT#C,LRCURV ,PWTC ,MRFLET#P,MRINTR#C,MRSHT  
    LRRAST ,LRSHPT ,DIAGSYN ,HASTER ,MRRAST ,MSCRAM#P,MRZIPP#C,LRSHOT  
    LRIOFF ,LRMRGN ,LRWTCR ,MRCURV ,LRTAF8 ,LRDOFF ,LRLEAD ,MRTVF8#P  
    LREOFF ,LRGRID ,MRJBCD ,MRSPIL#C,LRCNVT ,LRLON ,PID ,LRKON  
    MRANGE ,LRANGE ,LRNON ,LRAOFF ,MRCNVT ,LRMON ,MRLEAD ,MRTSF8#P  
    LRBOFF ,MRSCLR#C,LRCOFF ,LRGTUN ,MRTSG8#P,CER ,SENSOR ,LRSHGG  
    LRSCLR ,MRLABL#P,MRSPIL ,LRZAPP ,MRANGE#C,TEST2701,ERASER ,LRSPIL  
    MRCNVT#C,MRLEAD#C,MRSCLR ,MRRGON#C,MRTMF8#P,LRSTUG ,MRTAFA ,MRCPLT  
    LRCONT ,LRTAPN ,LRZIPP ,LRZIQQ ,LRTON ,SCRAMF ,MRSHPT#C,MRINTR  
    LRSON ,LINK1 ,LRINTR ,MRZIPP ,PAXER ,LRCPLT ,MRCURV#C,DIGNOSE  
    LRTAFA ,MRCNVT#P,PEAS ,MRLEAD#P,MRTSF8 ,LRTVF8 ,LRYLEG ,MRTSG8  
    LRTVF9 ,LRTSG8 ,LRTSF8 ,MRTVF8 ,MRLABL#C,MRANGE#P,MESSET ,LRTLEG  
    MSCRAM ,LRENT ,LRFLET ,CAXER ,MRCURV#P,LRPLOT ,LRXLEG ,MRRGON#P  
    MRTMF8#C,MRFLET ,LRSOFF ,LRMULP ,MRSHPT#P,TASTER ,LRSCAN ,LRTOFF  
TECHER  
    TECHER#C,TECHER#P  
MR8DEF  
    CR8DEF ,PR8DEF ,LR8DEF  
FLESH  
    FLESH#C ,FLESH#P  
MRFLAT  
    MRFLAT#C,MRFLAT#P,LRFLAT  
FLASH  
    FLASH#C ,FLASH#P

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# APPENDIX A (Con't)

## TABLE A-4 GPMLIB9 (LIBRARY)

GPMLIB9\$  
 NGAS1  
     NGAS1#P ,GASP ,NGAS1#C  
 NGAS3  
 NGAS2  
     NGAS2#P ,SETUP ,NGAS2#C  
 NGAS5  
     NGAS5#P ,ROOT ,NGAS5#C  
 NGAS4  
     SOLVE ,NGAS4#P ,NGAS4#C  
 NGAS7  
     NGAS7#P ,DPOLY ),NGAS7#C  
 NGAS6  
     ROOTX ,NGAS6#P ,NGAS6#C  
 NGAS9  
     PCHECK ,DCHECK ,NGAS9#P ,CHECS ,NGAS9#C ,TCHECK  
 NGAS8  
     NGAS8#P ,NGAS8#C ,SPLINA  
 NGAS10  
     NGAS10#C,NGAS10#P,DENS  
 NGAS23  
     NGAS23#C,SDINT ,NGAS23#P,HDINT  
 NGAS21  
     HSS ,NGAS21#C,NGAS21#P,SSS  
 NGAS12  
     NGAS12#C,NGAS12#P,DSF ,DDSF  
 NGAS13  
     PRESS ,NGAS13#C,NGAS13#P  
 NGAS31  
     NGAS31#C,CPPLRF ,NGAS31#P  
 NGAS14  
     NGAS14#C,NGAS14#P,TEMP  
 NGAS27  
     NGAS27#C,TSHF ,TPSF ,NGAS27#P  
 NGAS36  
     NGAS36#C,VISC ,NGAS36#P  
 NGAS26  
     NGAS26#C,NGAS26#P,TEMPPH  
 NGAS25  
     NGAS25#C,TEMPPS ,NGAS25#P  
 NGAS34  
     SETCPO ,NGAS34#C,NGAS34#P  
 NGAS35  
     NGAS35#C,NGAS35#P,THERM  
 NGAS17  
     NGAS17#C,NGAS17#P,TSS  
 NGAS24  
     NGAS24#C,NGAS24#P,SDINTF ,HDINTF  
 NGAS19  
     NGAS19#C,NGAS19#P,ENT ),ENTH  
 NGAS29  
     NGAS29#C,CPPLR ,NGAS29#P,SONIC

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# APPENDIX A (Con't)

## TABLE A-5 DATASYS.VINCE

DATASYS.VINCE  
 TSKTSK  
 TSKTSK#P, TSKTSK#C  
 CONHI  
 CONVTA , CONHI#P , CONHI#C  
 GATES  
 TRMWAR , TRMWR , GATES#P , TRMRD , GATES#C  
 BATS  
 BATS#P , BATSUM , BATS#C  
 DISPLY  
 DEMCAD , DISPLY#P , DISPLY#C  
 FNCL  
 FCALL , FLOAD , FLODED , FNCL#P , FNCL#C  
 KO  
 KDOUT , KO#P , KO#C  
 PLATS  
 PLAT , PLATS#P , PLATS#C  
 RCBER  
 RCBER#P , RCBER#C  
 FSETLN  
 SETLN , FSETLN#P , FSETLN#C  
 BLDOUT  
 OUTCNV , BLDOUT#P , BLDOUT#C  
 READER  
 DDEF LN , XMAS , RDLIN , DONER , RD ) , DDEF RD , RDRES , PUNKIN  
 RW  
 CONBCD  
 CNCVRT , CONBCD#P , CONBCD#C  
 CADRED\$  
 RDCAS\$ , RDCADP , DELRD\$ , SRTMB\$ , RDCADC , RDCADE  
 GETDATA  
 GETDAT , GETDAT#P , GETDAT#C  
 MAINHI  
 MAINTS , MAINHI#P , MAINHI#C  
 LINEC  
 LINEC#P , LINEC#C  
 BATCHS  
 BATCHS#P , BATCHS#C  
 LINE  
 LINE#P , LINE#C  
 DUMRES  
 SCANTO , DUMRES#P , DUMRES#C  
 FERROR  
 SETAD , CALERC , CALERR , GETERR , CALERW  
 FDGCHC  
 CHCERR , FDGCHC#P , FDGCHC#C  
 RSCANT  
 SCANT , RSCANT#P , RSCANT#C  
 FDGACN  
 ACONVT , FDGACN#C , FDGACN#P  
 RDHIGH  
 CHECK , ECTEST , RDHIGH#C , RDHDAT , RDHIGH#P  
 PLOTS  
 LSP , PLOTS#C , PLOTS#P  
 M  
 MEMBRMGR  
 MEMBRM#P , MEMBRM#C  
 BASKET  
 BASKET#C , BASKET#P  
 TSTSCN  
 TSTSCN#C , TSTSCN#P  
 ANALOG  
 MAINRA , ANLOG , MAINTA , ANALOG#C , ANALOG#P  
 RESET  
 RESET#C , RESET#P , XCHAN  
 PARAM  
 PARAM#C , GETLST , PARAM#P  
 QUTFDG  
 QUTEKE , QUTFDG#C , QUTFDG#P  
 RSDT  
 RESDT , RSDT#C , RSDT#P

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# APPENDIX A (Con't)

## TABLE A-5 (Con't)

CHANGE  
   CHANGE#C, CHANGE#P  
 MAINEND  
   MAINRR , MAINEN#C, MAINEN#P  
 ANAPRESS  
   ANAPRE#C, ANAPRE#P  
 RDMIS  
   RDM , RDMC , RDMP  
 NEWANA  
   NEWANA#P, NEWANA#C  
 TSTEC  
   TSTEC#P , TSTEC#C , TESTEC  
 CFRDWR  
   RDCFP , RDCFC , WRCFDS , RDCFDS  
 PURGE  
   PURGE#P , PURGE#C  
 PTERMM  
   PTERMM#P, PTERMM#C, TERMMP  
 TMAIN  
   TMAIN#P , TMAIN#C  
 BATCH  
   BATCH#P , BATCH#C  
 RCBASMB  
   RCBPUT , RCBP , RCBC  
 TESTH  
   TESTH#P , TESTH#C  
 COUPLE  
   CUCNTK , CUCNMV , COUPLE#C, COUPLE#P, FECNTK , FECNMV , CHALTK , CHALMV  
   CHCNTK , CHCNMV  
 WHIP  
   WHIP#C , WHIP#P  
 CPCONV  
   INCVRT , CPCONV#C, CPCONV#P  
 PFUD  
   PFUD#C , MINCAL , CALPRF , PFUD#P  
 PDPSND  
   PEESECT , PDPW , DLWPDP  
 SPEC  
   SPEC#C , SPEC#P , SPECIL  
 UNPK  
   SEPSGN , CNCTSP , UNPK#C , UNPK#P , UNPKIT , CMBSGN , INUNPK , CNCTPK  
 PHONY  
   PHONY#C , ANAS , PHONY#P  
 SCAN  
   SCAN#C , SCANV , SCAN#P  
 THERMO  
   THERMO#C, THERMO#P, THERM  
 CLMFMT  
   CLMF , CLMFMT#C, CLMFMT#P, FPTOAF , INTOAF , AFTOAF  
 HASH\$  
   HASH\$#C , HASH\$#P , GNHSE\$  
 PROMPT  
   PROMPT#C, PROMPT#P  
 DYN  
   DYN#C , DYNRES , DYNPRT , DYN#P , TIMDAT , DYNPRE  
 CADINT  
   CADINT#C, CADINT#P, RDRAWD  
 FUDGLIST  
   FUDGLI#C, FUDGLI#P  
 NEWLINE  
   NEWLIN#C, NEWLIN#P  
 RES  
   RES#C , RES#P , MAINRS  
 GFINDX  
   ZZDD , ZZFIND , QYPSECT , QYCSECT  
 CPCNVR  
   CPCNVR#C, FSTENG , CPCNVR#P  
 PATCH  
   PATCH#C , PATCH#P  
 TERMM  
   TERMM#C , TERMM#P  
 MIS  
   MIS#C , MIS#P

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# APPENDIX A (Con't)

## TABLE A-6 NEWNEW AEQLBRM (LIBRARY)

```

NEWNEW
AEQLBRM
  EQLBRM ,AEQLBR#C,AEQLBR#P
AMATRIX
  MATRIX ,AMATRI#P,AMATRI#C
ASNVL
  SNVL ,ASNVL#P ,ASNVL#C
AINSER
  INSER ,AINSER#P,AINSER#C
HMAIN
  HMAIN#P ,HMAIN#C
ALNMOD
  LNMOD ,ALNMOD#P,ALNMOD#C
HISIDEZ
  HISIDE#P,HISIDE#C,HISIDE
ASAVE
  SAVE ,MOLEST ,NEWOF ,ASAVE#P ,ASAVE#C ,SPCFRM
AVNPT
  VNPT ,AVNPT#P ,AVNPT#C
AFCCFX
  FCCFC ,AFCCFX#P,AFCCFX#C,FCCFT ,FCCFX
JTSCAN
  HRESCN ,JTSCAN#P,JTSCAN#C
AFLAREA
  FLAREA ,AFLARE#P,AFLARE#C
AVIETA
  VIETA ,AVIETA#P,AVIETA#C
APBAR
  PBAR ,APBAR#P ,APBAR#C ,PBARSP
DMAIN
  DMAIN#P ,DMAIN#C
AVARFMT
  AVARFM#P,VARFMT ,AVARFM#C
COMFILL
  COMFIL ,THMFIL ,COMFIL#C,COMFIL#P,TRNFIL
EQTRANS
  EQTRAN#C,EQTRAN#P
DTWATRZ
  DTWATR#C,DTWATR#P,DTWATR
ALINEAR
  LINE ,ALINEA#P,LININT ,ALINEA#C,LINEVL
AMATMUL
  MATMUL ,AMATMU#P,AMATMU#C
BDENPGM
AANEWTON
  NEWTON ,AANEWT#C,AANEWT#P
AQASFIT
  QASINT ,AQASFI#C,QASFIT ,AQASFI#P,QASONT ,QASIN ,QASOUT
CPHSZ
  CPHSZ#C ,CPHSZ#P ,CPHSXX
GARTABX
  TABX ,GARTAB#C,GARTAB#P
CUSPLINE
  CUSPLI#P,CUSPLI#C,CUBIN ,INTEG ,SPLINE
AFMACH
  FMACH ,AFMACH#C,AFMACH#P
SAVERXX
  SAVERX#C,SAVERX#P,SAVER
PRESTABL
  PTABLE ,PRESTA#P,PRESTA#C
HRERES1
  HRERES#P,MAINTS ,HRERES#C,MAINRS
SAVRD
  DSAV ,SAV ,ASAV ,SAVRD#C ,SAVRD#P
AHCALC
  HCALC ,AHCALC#C,AHCALC#P
ALMAIN
  ALMAIN#C,THERMO ,ALMAIN#P

```



# APPENDIX A (Con't)

## TABLE A-6 (Con't)

HREPRF  
     HREPRF#C, HREPRF#P  
 LAGRANG  
     LGRNGE , LAGRAN#C, LAGRAN#P  
 SPALDCHI  
     SPALDC#P, SPALDC#C, XVIRTL , SPACHI  
 VENTURI  
     VENTUR#P, VENTUR#C, VENTUR  
 FCPRZ  
     FCPR , FCPRZ#P , FCPRZ#C  
 AGAUSS  
     AGAUSS#P, AGAUSS#C, GAUSS  
 AFLWFLD  
     AFLWFL#P, AFLWFL#C, FLWFLD  
 ATOMBLK  
 FMFRZ  
     FMFRZ#P , FMFR , FMFRZ#C , FMFR0  
 AFGAMJ  
     AFGAMJ#P, AFGAMJ#C, FGAMJ  
 ACQAIN  
     CQACXS , CQAIN , ACQAIN#P, CQAIS , CQACIS , ACQAIN#C  
 AWAC  
     AWAC#P , AWAC#C , WAC  
 PERIODSP  
     PERIN , PERIOD#C, PINTG , PERSPL , PERIOD#P  
 ACATA  
 TABL3Z  
     TABLE3 , TABL3Z#P, TABL3Z#C  
 TABLOZ  
     TABLE0 , TABLOZ#P, TABLOZ#C  
 ANSHKTT  
     ANSHKT#P, NSHKT , ANSHKT#C  
 AAMINV  
     AAMINV#P, AAMINV#C, MINV  
 AFROZEN  
     AFROZE#P, AFROZE#C, FROZEN  
 HREPLT  
     HREPLT#C, HREPLT#P, HPLT  
 GETHRE  
     GETDAT , GETHRE#C, GETHRE#P  
 GARBISC  
     GARBIS#C, GARBIS#P, BISC  
 AEFMT  
     AEFMT#C , AEFMT#P , EFMT  
 TRNSPORT  
     ENT3 , ENT2 , ENT1 , ENT7 , ENT6 , ENT5 , ENT4 , ENT9  
     ENT8 , TRNSPO#P, TRNSET , TRNSPO#C  
 ARKTOUT  
     ARKTOU#C, ARKTOUT#P, RKTOUT  
 ASKNFR  
     ASKNFR#C, ASKNFR#P, SKNFR  
 ACONSHK  
     ACONSH#P, ACONSH#C, CONSHK  
 EULIST  
     EULIST#C, EULIST#P  
 WNDTNLZ  
     WNDTNL , WNDTNL#C, WNDTNL#P  
 GARDTAVX  
     GARDTA#C, DTABX , GARDTA#P  
 APAFIT  
     APAFIT#C, APAFIT#P, PAINTG , PAFIT , PAINTP  
 SYMGAUSS  
     SYMGAU#C, SYMGAU#P, GAUSYM  
 FGAMZ  
     FGAMZ#C , FGAMZ#P , FGAM  
 ACPHS  
     ACPHS#C , ACPHS#P , CPHS





# APPENDIX A (Con't)

## TABLE A-7 TESTCD1 (LIBRARY)

TESTCD1  
BDCNVCD1  
OUTHRE  
OUTJT3 ,OUTJT2 ,OUTJT1 ,OUTJT5 ,OUTJT ,OUTHRE#P,OUTHRE#C  
IR4ORH  
ZIR4OT ,ZIR4OM ,IR4ORH#P,IR4ORH#C  
DUMMY  
DUMMY#P ,DUMMY#C  
ORIFICE  
ORIFIC ,ORIFIC#P,ORIFIC#C  
BDEN35  
BDEN34  
BDEN70  
BDCN30  
FREDSFIX  
FREDSF#C,FREDSF#P,WEDINT ,FUD ,WEDEXT  
BDEN30  
BDCN36  
BDCN34  
BDCN70  
BDEN76  
RESDAT  
RESDT ,RESDAT#C,RESDAT#P  
BDCN93  
HPLOTS  
HPLOTS#C,LSP ,HPLOTS#P  
BDCN92XX  
BDEN93  
BDCN49  
ADDRAG  
FADRAG ,ADDRAG#C,ADDRAG#P  
BDCN97  
D3INTY  
D3INTY#P,INTY ,D3INTY#C  
BDCNVT5  
BDENGCD1  
LATE  
LATE#C ,LATE#P  
DUM  
DUM#C ,DUM#P  
DYN  
DYN#C ,DYNRES ,DYNPRT ,DYN#P ,TIMDAT ,DYNPRE  
D3SINTP  
D3SINT#P,SINTP ,D3SINT#C

## TABLE A-8 VINCENW ALIMITS (LIBRARY)

VINCENW  
ALIMITS  
LIMITS ,ALIMIT#P,ALIMIT#C  
DUMDTW  
DUMDTW#C,DUMDTW#P,DTWATR  
SUMWTZ  
SUMWTZ#C,SUMWTZ#P,SUMWT

## TABLE A-9 VINNEW2 (LIBRARY)

VINNEW2  
PSBLK17  
PSBLK70  
PSBLK36  
PSBLK65

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APPENDIX A (Con't)  
TABLE A-10 DATASYS.DAN  
(LIBRARY)

DATASYS.DAN  
SQCP  
SQCP#P , SQCP#C  
NEWEST  
NEWEST#C, NEWEST#P, SCANTO  
SANTY  
SANTY#C , SANTY#P , SCANT

TABLE A-11 TESHRE  
(LIBRARY)

TESHRE  
ANEWTOD  
NEWTOD , ANEWTO#P, ANEWTO#C  
AINLETT  
AINLET#P, INLETT , AINLET#C  
BDCN76  
AMODEL  
COWLEX , MODEL , CWLXDA , SPIKE1 , CWLIN1 , CWLEX1 , CWLNDA , AMODEL#C  
SPIKE , SPIKDA , COWLIN , AMODEL#P  
BDCN64  
ACHMIST  
ACHMIS#C, CHMIST , ACHMIS#P  
BDCN71  
AHTXFER  
HTXFER , AHTXFE#P, AHTXFE#C  
GSTRUTD  
STRUTD , GSTRUT#C, GSTRUT#P  
ANOZZL1  
NOZZL1 , ANOZZL#C, ANOZZL#P  
ALINTRP  
ALINTR#C, ALINTR#P, LINTRP  
EUFLOAD  
FLOADC , EUFLOA#P, EUFLOA#C  
ANOZ  
ANOZ#P , ANOZ#C , NOZZLE  
CONVTAZ  
CONVTA , CONVTA#P, CONVTA#C  
GTWTBL  
GTWTBL#C, GTWTBL#P, TWTBL  
HREPRR1  
PERFOR , HREPRR#P, HREPRR#C  
ATWTABL  
ATWTAB#P, ATWTAB#C, TWTABL

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TABLE A-12 NEWLIB  
(LIBRARY)

NEWLIB  
AOUTPUT  
OUTPUT , AOUTPU#P, AOUTPU#C  
AENTHBO  
AENTHB#C, ENTHBO , AENTHB#P  
ACMBSTR  
CMBSTR , ACMBST#C, ACMBST#P  
BDCN65  
ENG65  
ENGPGM , ENG65#C , ENG65#P  
BDCN63  
AOUT1  
AOUT1#P , AOUT1#C , OUT1 , OUT3 , OUT2 , OUT5 , OUT4  
ASURFPS  
PSCWLE , PSCWLI , ASURFP#P, PSINNR , SURFPS , ASURFP#C  
ASEARCH  
ASEARC#C, ASEARC#P, SEARCH  
AREACT  
AREACT#C, AREACT#P, REACT  
LSTAPRS  
LSTAPR#C, STAPRS , LSTAPR#P



## APPENDIX B

### PROCEDURES

The following procedures were used to facilitate operation of the AIM data-reduction computer program.



# APPENDIX B

```

BL57 0000000 PROCDEF BL57
BL57 0001000 PARAM $R,$B,$F1,$F2,$F3,$F4,$F5,$F6,$F7,$F8,$I1,$I2,$I3,$I4,$T1,$T2,$T3,$T4
BL57 0002000 DEFAULT SYSINX=E
BL57 0003000 PROCDEF TC$R=$B
BL57 0004000 QUALIFY AITXFER
BL57 0005000 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=$T1,TIOUT=$T2,TOIN=$T3,TOOUT=$T4
BL57 0006000 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
BL57 0007000 QUALIFY ENPGM
BL57 0008000 SET IFUEL(1)=$F1,IFUEL(2)=$F2,IFUEL(3)=$F3,IFUEL(4)=$F4
BL57 0009000 SET IFUEL(5)=$F5,IFUEL(6)=$F6,IFUEL(7)=$F7,IFUEL(8)=$F8
BL57 0010000 SET IGNON(1)=$I1,IGNON(2)=$I2,IGNON(3)=$I3
BL57 0011000 SET DORE=2.0
BL57 0012000 DISPLAY IFUEL,IGNON,DORE
BL57 0013000 _END
BL57 0014000 DEFAULT SYSINX=G
BL69 0000000 PROCDEF BL69
BL69 0001000 PARAM $R,$B,$I,$J,$K,$L,$M,$N,$O,$P,$Q,$R,$S,$T,$U,$V,$W,$X,$Y,$Z
BL69 0002000 DEFAULT SYSINX=E
BL69 0003000 PROCDEF TC$R=$B
BL69 0004000 EXCISE 200
BL69 0005000 INSERT 100,50
BL69 0006000 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=$I,TIOUT=$J,TOIN=$K,TOOUT=$L
BL69 0007000 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
BL69 0008000 _END
BL69 0009000 DEFAULT SYSINX=G
BORED 0000000 PROCDEF BORED
BORED 0001000 DISPLAY ACM$STR,ISTA
BORED 0002000 GO
CDINJ 0000000 PROCDEF CDINJ
CDINJ 0001000 QUALIFY ACM$STR
CDINJ 0002000 AT 60;DISPLAY JINJ,TERM1,PT,AINJ,FM,GAMF,TTT(3),GAMMAS(3),UM(3),CDINJ(100),VHOC(3)
CHGBDCN 0000000 PROCDEF CHGBDCN
CHGBDCN 0001000 PARAM $I
CHGBDCN 0002000 DEFAULT SYSINX=E
CHGBDCN 0003000 PROCDEF HRERUN5
CHGBDCN 0004000 REVISE 1700
CHGBDCN 0005000 LOAD BDCN$1;DISPLAY 'BLOCK DATA LOADED: BDCN$1'
CHGBDCN 0006000 LIST 1700
CHGBDCN 0007000 _END
CHGBDCN 0008000 DEFAULT SYSINX=G
CHGBDEN 0000000 PROCDEF CHGBDEN
CHGBDEN 0001000 PARAM $I
CHGBDEN 0002000 DEFAULT SYSINX=E
CHGBDEN 0003000 PROCDEF HRERUN5
CHGBDEN 0004000 REVISE 1600
CHGBDEN 0005000 LOAD BDEN$1;DISPLAY 'BLOCK DATA LOADED: BDEN$1'
CHGBDEN 0006000 LIST 1600
CHGBDEN 0007000 _END
CHGBDEN 0008000 DEFAULT SYSINX=G
CHGPSBLK 0000000 PROCDEF CHGPSBLK
CHGPSBLK 0001000 PARAM $I
CHGPSBLK 0002000 DEFAULT SYSINX=E
CHGPSBLK 0003000 PROCDEF HRERUN5
CHGPSBLK 0004000 REVISE 1500
CHGPSBLK 0005000 LOAD PSBLK$1;DISPLAY 'BLOCK DATA LOADED: PSBLK$1'
CHGPSBLK 0006000 LIST 1500
CHGPSBLK 0007000 _END
CHGPSBLK 0008000 DEFAULT SYSINX=G
CHGTC 0000000 PROCDEF CHGTC
CHGTC 0001000 PARAM $R,$I,$J,$K,$L,$M,$N,$O,$P,$Q,$R,$S,$T,$U,$V,$W,$X,$Y,$Z
CHGTC 0002000 PROCDEF TC$R=$I
CHGTC 0003000 EXCISE LAST
CHGTC 0004000 EXCISE LAST
CHGTC 0005000 END
CHGTC 0006000 IF '$2'='';CHGTC $R,$I,$J,$K,$L,$M,$N,$O,$P,$Q,$R,$S,$T,$U,$V,$W,$X,$Y,$Z
CKAREA 0000000 PROCDEF CKAREA
CKAREA 0001000 QUALIFY MODEL
CKAREA 0002000 AT 4(5);IF XI<55.75;IF XI<55.9;DISPLAY XII,XI,N,R,AREA,DRDX,SIGMA
C033 0000000 PROCDEF C033
C033 0001000 KDOSEL 60,65,67,83,84,85,86,87,88,91,92,123,124,148,154,156,158,160,162,164
C033 0002000 KDOSEL 165,166,168,171,172,174,175,176,180,181,182,183,186,191,206
C033 0003000 KDOSEL 208,212,226,228,230,231,236,239,240,241,244,248,249,290,292
C033 0004000 KDOSEL 305,306,307,308,309,310,311,312,313,314,315,316,317,318,319
C033 0005000 KDOSEL 320,321,322,323,324,325,326,327,328,329,330,331,332,333,334
C033 0006000 KDOSEL 335,336,337,338
C033 0007000 KDOSEL 399
C033 0008000 QUALIFY AINLETT
C033 0009000 AT 3(2);SET VAL(11,INITRO)=.73448,VAL(11,IOXY)=.26552;DISPLAY VAL(11,INITRO),VAL(11,IOXY)
C033 0010000 QUALIFY STAPRS
C033 0011000 AT 320(2);DISPLAY 'INPUT PSI(1,1), THEN TYPE GO'
C034 0000000 PROCDEF C034
C034 0001000 KDOSEL 60,65,67,84,85,86,87,88,92,123,124,148,154,156,158,160,162,164
C034 0002000 KDOSEL 166,168,171,172,174,176,180,181,182,183,186,191,195,199,201
C034 0003000 KDOSEL 206,208,212,226,228,230,231,236,240,241,244,248,249,252,290,292
C034 0004000 KDOSEL 305,306,307,308,309,310,311,312,313,314,315,316,317,318,319
C034 0005000 KDOSEL 320,321,322,323,324,325,326,327,328,329,330,331,332,334,335
C034 0006000 KDOSEL 336,337,338
C034 0007000 KDOSEL 399
C034 0008000 QUALIFY AINLETT
C034 0009000 AT 3(2);SET VAL(11,INITRO)=.73448,VAL(11,IOXY)=.26552;DISPLAY VAL(11,INITRO),VAL(11,IOXY)
C036 0000000 PROCDEF C036

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# APPENDIX B (Con't)

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C036 0000100 KDOSEL 60, 65, 66, 67, 123, 124, 144, 154, 156, 158, 160, 162, 164, 166, 168, 171, 172, 174, 181
C036 0000200 KDOSEL 182, 186, 191, 195, 199, 206, 208, 218, 228, 230, 231, 236, 240, 241, 244
C036 0000300 KDOSEL 248, 249, 252, 289, 290, 292, 294, 305, 310, 312, 313, 314, 315, 320
C036 0000400 KDOSEL 399
C036 0000500 QUALIFY AINLETT
C036 0000600 AT 3(2);SET VAL(11, INITRO)=.73448, VAL(11, IOXY)=.26552; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C036 0000700 PROCDEF C038
C036 0000800 KDOSEL 60, 65, 66, 67, 123, 124, 144, 154, 168, 174, 181, 182, 186, 191, 195, 199, 201, 206, 228
C036 0000900 KDOSEL 230, 231, 236, 240, 241, 244, 248, 249, 252, 290, 292, 294, 305, 310, 312, 313
C036 0001000 KDOSEL 314, 315, 319, 320
C036 0001100 KDOSEL 399
C036 0001200 QUALIFY AINLETT
C036 0001300 AT 3(2);SET VAL(11, INITRO)=.73448, VAL(11, IOXY)=.26552; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C036 0001400 QUALIFY STAPRS
C036 0001500 AT 320(2); DISPLAY 'INPUT PSI(1,1), THEN TYPE GO'
C052 0000000 PROCDEF C052
C052 0000100 KDOSEL 65, 66, 67, 124, 137, 139, 141, 158, 165, 168, 178, 181, 182, 195, 199, 200, 201, 206, 208
C052 0000200 KDOSEL 226, 230, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315, 320, 329, 399
C052 0000300 QUALIFY AINLETT
C052 0000400 AT 3(2);SET VAL(11, INITRO)=.73448, VAL(11, IOXY)=.26552; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C054 0000000 PROCDEF C054
C054 0000100 KDOSEL 65, 66, 67, 124, 137, 139, 141, 156, 165, 168, 178, 181, 182, 195, 199, 200, 201, 206, 226, 230
C054 0000200 KDOSEL 249, 252, 268, 269, 290, 292, 294, 305, 313, 314, 315, 319, 320, 329, 399
C054 0000300 QUALIFY AINLETT
C054 0000400 AT 3(2);SET VAL(11, INITRO)=.73448, VAL(11, IOXY)=.26552; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C057 0000000 PROCDEF C057
C057 0000100 KDOSEL 62, 65, 66, 74, 124, 137, 139, 158, 160, 168, 172, 179, 181, 182, 183, 187, 190, 195, 199
C057 0000200 KDOSEL 201, 206, 226, 230, 248, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315, 320, 321
C057 0000300 KDOSEL 329
C057 0000400 KDOSEL 399
C057 0000500 QUALIFY AINLETT
C057 0000600 AT 3(2);SET VAL(11, INITRO)=.73613, VAL(11, IOXY)=.26387; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C060 0000000 PROCDEF C060
C060 0000100 KDOSEL 62, 65, 66, 74, 124, 137, 139, 158, 160, 168, 172, 179, 181, 182, 183, 187, 190, 195, 199
C060 0000200 KDOSEL 201, 206, 226, 230, 248, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315, 319, 320
C060 0000300 KDOSEL 321, 329
C060 0000400 KDOSEL 399
C060 0000500 QUALIFY AINLETT
C060 0000600 AT 3(2);SET VAL(11, INITRO)=.73613, VAL(11, IOXY)=.26387; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C061 0000000 PROCDEF C061
C061 0000100 KDOSEL 62, 65, 66, 74, 124, 137, 139, 158, 160, 168, 172, 179, 181, 182, 183, 187, 190, 195, 199
C061 0000200 KDOSEL 201, 206, 226, 230, 248, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315, 319, 320
C061 0000300 KDOSEL 321, 329
C061 0000400 KDOSEL 399
C061 0000500 QUALIFY AINLETT
C061 0000600 AT 3(2);SET VAL(11, INITRO)=.73928, VAL(11, IOXY)=.26072; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C063 0000000 PROCDEF C063
C063 0000100 KDOSEL 62, 65, 66, 74, 124, 137, 139, 158, 160, 168, 172, 179, 181, 182, 183, 187, 190, 195, 197
C063 0000200 KDOSEL 199, 201, 206, 226, 230, 248, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315, 319
C063 0000300 KDOSEL 320, 321, 329
C063 0000400 KDOSEL 399
C063 0000500 QUALIFY AINLETT
C063 0000600 AT 3(2);SET VAL(11, INITRO)=.7724, VAL(11, IOXY)=.2276; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C064 0000000 PROCDEF C064
C064 0000100 KDOSEL 62, 65, 66, 74
C064 0000200 KDOSEL 124, 137, 139, 148, 158, 160, 168, 172, 179, 181, 182, 183, 187, 190, 195
C064 0000300 KDOSEL 197, 199, 201, 206, 226, 230, 248, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315
C064 0000400 KDOSEL 319, 320, 321, 329, 399
C064 0000500 QUALIFY AINLETT
C064 0000600 AT 3(2);SET VAL(11, INITRO)=.76751, VAL(11, IOXY)=.23249; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C065 0000000 PROCDEF C065
C065 0000100 KDOSEL 62, 65, 66, 74, 137, 139, 181, 182, 183, 187, 188, 190, 195, 197, 199, 201, 206, 226, 230
C065 0000200 KDOSEL 248, 252, 289, 290, 292, 294, 305, 313, 314, 315, 320, 321, 329, 399
C065 0000300 QUALIFY AINLETT
C065 0000400 AT 3(2);SET VAL(11, INITRO)=.76751, VAL(11, IOXY)=.23249; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C069 0000000 PROCDEF C069
C069 0000100 KDOSEL 62, 65, 66, 74, 137, 139, 181, 182, 183, 187, 190, 195, 197, 199, 201, 206, 226, 230, 248, 252
C069 0000200 KDOSEL 289, 290, 292, 294, 305, 313, 314, 315, 320, 321, 322, 329, 399
C069 0000300 QUALIFY AINLETT
C069 0000400 AT 3(2);SET VAL(11, INITRO)=.76479, VAL(11, IOXY)=.23521; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C071 0000000 PROCDEF C071
C071 0000100 KDOSEL 53, 62, 65, 66, 74, 124, 137, 139, 158, 160, 172, 179, 181, 182, 183, 187, 190, 195, 197, 199
C071 0000200 KDOSEL 201, 206, 226, 230, 248, 249, 252, 289, 290, 292, 294, 305, 313, 314, 315, 320, 321, 322, 329, 399
C071 0000300 QUALIFY AINLETT
C071 0000400 AT 3(2);SET VAL(11, INITRO)=.75452, VAL(11, IOXY)=.24548; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C088 0000000 PROCDEF C088
C088 0000100 KDOSEL 39, 22, 23, 54, 55, 60, 62, 64, 67, 74, 95, 124, 137, 139, 157, 158, 160
C088 0000200 KDOSEL 162, 165, 166, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 181
C088 0000300 KDOSEL 182, 183, 187, 190, 195, 197, 199, 206, 226, 227, 230, 235, 241, 248, 249
C088 0000400 KDOSEL 250, 252, 278, 289, 290, 292, 294, 305, 313, 314, 315, 320, 321, 329, 349
C088 0000500 KDOSEL 353, 366, 367, 368, 369, 370, 374, 375, 378, 379, 382, 388, 394, 395, 399
C088 0000600 QUALIFY AINLETT
C088 0000700 AT 3(2);SET VAL(11, INITRO)=.75328, VAL(11, IOXY)=.24672; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
C088 0000800 QUALIFY ANOZ
C088 0000900 AT 360(3);SET DRAGEX=-0.5*QOAC; DISPLAY DRAGEX, DRAGEX*PSIATH, 'DRAGEX = -0.5*QO*AC'
C088 0001000 QUALIFY CONVTA
C088 0001100 AT 0;SET MV(53)=MV(53), MV(66)=MV(53); DISPLAY MV(53), MV(65), MV(66)
C088 0001200 SETPS 123, 0.690
C089 0000000 PROCDEF C089
C089 0000100 KDOSEL 54, 55, 60, 62, 64, 67, 74, 95, 124, 137, 139, 157, 158, 160, 165, 166, 169
C089 0000200 KDOSEL 172, 175, 176, 179, 181, 182, 183, 187, 190, 195, 197, 199
C089 0000300 KDOSEL 210, 223, 224, 226, 227, 230, 235, 248, 249, 250, 252, 289, 290, 292, 294
C089 0000400 KDOSEL 305, 313, 320, 321, 329, 399
C089 0000500 QUALIFY AINLETT

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## APPENDIX B (Con't)

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# APPENDIX B (Con't)

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DRG      0000000 PROCDEF DRG
DRG      0000100 PARAM $READ,$BLK,$DRGX
DRG      0000200 DEFAULT SYSINX=E
DRG      0000300 PROCDEF TC$READ=$BLK
DRG      0000400 INSERT LAST
DRG      0000500 QUALIFY ANOZ
DRG      0000600 AT 360(3);SET DRAGEX=$DRGX;DISPLAY DRAGEX
DRG      0000700 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - SO DO 6 REMOVES INSTEAD OF 5 AT THE END'
DRG      0000800 _END
DRG      0000900 DEFAULT SYSINX=G
DSS      0000000 PROCDEF DSS
DSS      0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
DSS      0000200 DSS? PRNT$1
DSS      0000300 IF '$2'='1';DSS $2,$3,$4,$5,$6,$7,$8,$9,$10,
FIXDRG   0000000 PROCDEF FIXDRG
FIXDRG   0000100 PARAM $R,$B,$I
FIXDRG   0000200 DEFAULT SYSINX=E
FIXDRG   0000300 PROCDEF TC$R=$B
FIXDRG   0000400 INSERT LAST
FIXDRG   0000500 QUALIFY ANOZ
FIXDRG   0000600 AT 360(3);SET DRAGEX=$1/PSIATM;DISPLAY DRAGEX=PSIATM;DRAGEX,'DRAGEX INPUT THIS RUN'
FIXDRG   0000700 _END
FIXDRG   0000800 DEFAULT SYSINX=G
FIX61    0000000 PROCDEF FIX61
FIX61    0000100 PARAM $R,$1,$2,$3,$4,$5,$6,$7,$8,$9,$10,$11
FIX61    0000150 PROCDEF TC$R=$1
FIX61    0000200 EXCISE 200
FIX61    0000300 EXCISE 900
FIX61    0000400 LIST 100,300
FIX61    0000500 LIST LAST
FIX61    0000600 IF '$2'='1';FIX61 $R,$2,$3,$4,$5,$6,$7,$8,$9,$10,$11
FIX61    0000700 PROCDEF FIX64
FIX64    0000100 QUALIFY ASUREPS
FIX64    0000200 AT 22;SET NCHCI(2,12)=200,NCHCI(4,12)=228,NCHCE(2,8)=177,NCHCE(4,8)=179,NCHCE(2,12)=247
FIX65    0000000 PROCDEF FIX65
FIX65    0000100 PARAM $R,$1,$2,$3,$4,$5,$6,$7,$8,$9,$10
FIX65    0000150 DEFAULT SYSINX=E
FIX65    0000200 PROCDEF TC$R=$1
FIX65    0000300 LIST 900
FIX65    0000400 EXCISE 900
FIX65    0000450 END
FIX65    0000500 IF '$2'='1';FIX65 $R,$2,$3,$4,$5,$6,$7,$8,$9,$10
FIX65    0000700 DEFAULT SYSINX=G
GASCAL   0000000 PROCDEF GASCAL
GASCAL   0000100 PARAM $RDNO,$N,$D
GASCAL   0000200 DEFAULT SYSINX=E
GASCAL   0000300 PROCDEF COSRDNO
GASCAL   0000400 INSERT LAST
GASCAL   0000500 QUALIFY AINLETT
GASCAL   0000600 AT 3(2);SET VAL(11,INITRO)=$N,VAL(11,IOXY)=$D;DISPLAY VAL(11,INITRO),VAL(11,IOXY)
GASCAL   0000700 _END
GASCAL   0000800 DEFAULT SYSINX=G
GRABBER  0000000 PROCDEF GRABBER
GRABBER  0000100 PARAM $1
GRABBER  0000200 ERASE YHTFX2.T001
GRABBER  0000300 RMDS READNG$1,YHTFX2.T001
KD0SEL   0000000 PROCDEF KD0SEL
KD0SEL   0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10,$11,$12,$13,$14,$15,$16,$17,$18,$19,$20
KD0SEL   0000200 QUALIFY KDOUT
KD0SEL   0000300 SET NK0SEL=NK0SEL+1
KD0SEL   0000400 SET INDX=NK0SEL
KD0SEL   0000500 SET K0SEL(INDX)=$1
KD0SEL   0000600 IF '$2'='1';DISPLAY NK0SEL
KD0SEL   0000700 IF '$2'='1';KD0SEL $2,$3,$4,$5,$6,$7,$8,$9,$10,$11,$12,$13,$14,$15,$16,$17,$18,$19,$20
LSTC     0000000 PROCDEF LSTC
LSTC     0000100 PARAM $R,$B1,$B2,$B3,$B4,$B5,$B6,$B7,$B8,$B9,$B10
LSTC     0000300 PROCDEF TC$R=$B1
LSTC     0000350 LIST 0, LAST
LSTC     0000400 END
LSTC     0000450 IF '$B2'='1';LSTC $R,$B2,$B3,$B4,$B5,$B6,$B7,$B8,$B9,$B10
LSTCO    0000000 PROCDEF LSTCO
LSTCO    0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
LSTCO    0000200 DEFAULT SYSINX=E
LSTCO    0000300 PROCDEF CO$1
LSTCO    0000400 LIST LAST
LSTCO    0000500 END
LSTCO    0000600 IF '$2'='1';LSTCO $2,$3,$4,$5,$6,$7,$8,$9,$10
LSTCO    0000700 DEFAULT SYSINX=G
LSTP     0000000 PROCDEF LSTP
LSTP     0000100 PARAM N1
LSTP     0000200 PROCDEF N1
LSTP     0000300 LIST 0, LAST
LSTP     0000400 END
MIGDS    0000000 PROCDEF MIGDS
MIGDS    0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
MIGDS    0000200 MDS READNG$1
MIGDS    0000300 PMC? READNG$1
MIGDS    0000400 IF '$2'='1';MIGDS $2,$3,$4,$5,$6,$7,$8,$9,$10
MOVIES   0000000 PROCDEF MOVIES
MOVIES   0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
MOVIES   0000200 RMDS READNG$1
MOVIES   0000500 DSS? READNG$1
MOVIES   0000700 IF '$2'='1';MOVIES $2,$3,$4,$5,$6,$7,$8,$9,$10

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# APPENDIX B (Con't)

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PC      0000000 PROCDEF PC
PC      0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10,$11,$12,$13,$14
PC      0000200 PC? READNG$1
PC      0000300 IF '$2'='1';PC $2,$3,$4,$5,$6,$7,$8,$9,$10,$11,$12,$13,$14
PDAOB  0000000 PROCDEF PDAOB
PDAOB  0000100 QUALIFY STAPRS
PDAOB  0000150 AT 36(4);DISPLAY PDAOB
PDAOB  0000175 AT 38;DISPLAY PDAOB,XCE(1),PAYCE(1),ANOW
PDAOB  0000200 AT 40;DISPLAY PDAOB,PNOA,PLAST,ANOW,ALAST
PDAOB  0000300 AT 400;DISPLAY LCH(K1),CH(K1),PBAR1,M
PDAOB  0000400 AT 420;DISPLAY LCH(K1),CH(K1),PBAR2,M
PDAOB  0000500 AT 420(4);DISPLAY PBAR1,PBAR2,PDAOB
PDAOB  0000600 AT 430;DISPLAY LCH(NX3),CH(NX3),WT3,PBAR
PDAOB  0000700 AT 440;DISPLAY LCH(K1),CH(K1),PBAR1,M
PDAOB  0000800 AT 450;DISPLAY PBAR,WT4,WTSUM
PDAOB  0000900 AT 460;DISPLAY LCH(NX5),CH(NX5),PBAR,WT5,WTSUM
PDAOB  0001000 AT 470;DISPLAY LCH(NX6),CH(NX6),PBAR,WT6,WTSUM
PDAOB  0001100 AT 480;DISPLAY LCH(NX7),CH(NX7),PBAR,WT7,WTSUM
PDAOB  0001200 AT 490;DISPLAY LCH(K1),CH(K1),PBAR1,M
PDAOB  0001300 AT 500;DISPLAY PBAR,WT10,WTSUM
PDAOB  0001400 AT 510;DISPLAY LCH(K1),CH(K1),PBAR1,M
PDAOB  0001500 AT 520;DISPLAY PBAR,WT11,WTSUM
PDAOB  0001600 AT 530;DISPLAY LCH(NX12),CH(NX12),PBAR,WT12,WTSUM
PDAOB  0001700 AT 540(2);DISPLAY LCH(NX13),CH(NX13),PBAR,WT13,WTSUM,PDAOB
PRNT   0000000 PROCDEF PRNT
PRNT   0000100 PARAM $NUM
PRNT   0000200 ERASE PRIN$NUM
PRNT   0000300 DDEF LIBR$NUM,VS,PRIN$NUM,RET=T
PRNT   0000400 DISPLAY 'LIBR$NUM IS PRIN$NUM'
PRNT   0000500 CDS PRNT$NUM,PRIN$NUM
PRNT   0000600 PRINT PRIN$NUM,PRISP=EDIT,STATION=RJE02
PRNT   0000700 RELEASE LIBR$NUM
PRNTMV 0000000 PROCDEF PRNTMV
PRNTMV 0000100 PARAM $1,$2,$3,$4,$5
PRNTMV 0000200 QUALIFY CONVT
PRNTMV 0000300 AT 101(2);DISPLAY MV($1),CH($1)
PRNTMV 0000400 IF '$2'='1';PRNTMV $2,$3,$4,$5
PS71   0000000 PROCDEF PS71
PS71   0000050 DISPLAY 'PS71 VALID FOR READINGS 71, 64, 63, 61, 60, 57, 54, 52'
PS71   0000100 QUALIFY ASURFPS
PS71   0000200 AT 22;SET NCHCI(1,12)=200,NCHCI(2,12)=228
PS71   0000300 AT 42;SET NCHCE(3,8)=177,-
PS71   0000400 NCHCE(2,12)=247
PS89   0000000 PROCDEF PS89
PS89   0000100 DISPLAY 'PS89 VALID FOR RDGS 89 THRU 91 AND 93 THRU 96.'
PS89   0000200 QUALIFY ASURFPS
PS89   0000300 AT 22;SET NCHCI(2,12)=200, NCHCI(4,12)=228
PS89   0000400 AT 42;SET NCHCE(2,4)=167, NCHCE(4,4)=169,-
PS89   0000500 NCHCE(2,8)=177, NCHCE(4,8)=179,-
PS89   0000600 NCHCE(1,11)=154,-
PS89   0000700 NCHCE(2,12)=247
PS92   0000000 PROCDEF PS92
PS92   0000050 DISPLAY 'PS92 VALID FOR READINGS 65, 69, 88, 92 AND 97. THESE READINGS NEED INPUT FOR EXTERNAL DRAG.'
PS92   0000100 QUALIFY SURFPS
PS92   0000400 AT 22;SET NCHCI(2,12)=200,NCHCI(4,12)=228
PS92   0000500 AT 42;BRANCH 49(2)
PS92   0000600 QUALIFY STAPRS
PS92   0000700 AT 36(2);BRANCH 540(2)
PS92   0000800 AT 112(6);BRANCH 115(5)
PUKE2  0000000 PROCDEF PUKE2
PUKE2  0000100 PARAM $NUM
PUKE2  0000200 ERASE PRNT$NUM
PUKE2  0000300 DDEF LIBR$NUM,VS,PRNT$NUM,RET=T
PUKE2  0000400 DISPLAY 'LIBR$NUM IS PRNT$NUM'
PUKE2  0000500 CDS PRT1,PRNT$NUM
PUKE2  0000600 CDS PRT1,PRNT$NUM
PUKE2  0000700 PRINT PRNT$NUM,PRISP=EDIT,STATION=RJE02
PUKE2  0000800 RELEASE LIBR$NUM
PUKE2P 0000000 PROCDEF PUKE2P
PUKE2P 0000100 PARAM $NUM
PUKE2P 0000200 ERASE PRNT$NUM
PUKE2P 0000300 CDS PRT1,PRNT$NUM
PUKE2P 0000400 CDS PRT1,PRNT$NUM
PUKE2P 0000500 PRINT PRNT$NUM,PRISP=EDIT,STATION=RJE02
PUKE1  0000000 PROCDEF PUKE1
PUKE1  0000100 PARAM $NUM
PUKE1  0000200 ERASE PRNT$NUM
PUKE1  0000300 DDEF LIBR$NUM,VS,PRNT$NUM,RET=T
PUKE1  0000400 DISPLAY 'LIBR$NUM IS PRNT$NUM'
PUKE1  0000500 CDS PRT1,PRNT$NUM
PUKE1  0000600 PRINT PRNT$NUM,PRISP=EDIT,STATION=RJE02
PUKE1  0000700 RELEASE LIBR$NUM
PUSH   0000000 PROCDEF PUSH
PUSH   0000050 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
PUSH   0000100 PRINT PRNT$1,PRISP=EDIT,STATION=RJE02
PUSH   0000200 IF '$2'='1';PUSH $2,$3,$4,$5,$6,$7,$8,$9,$10
PUTIN  0000000 PROCDEF PUTIN
PUTIN  0000100 PARAM TCNUM,THEFIX
PUTIN  0000200 DEFAULT SYSIN=X
PUTIN  0000300 PROCDEF TCNUM
PUTIN  0000400 INSERT LAST
PUTIN  0000500 THEFIX
PUTIN  0000600 _END
PUTIN  0000700 DEFAULT SYSIN=X

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# APPENDIX B (Con't)

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RUBOUT 0000000 PROCDEF RUBOUT
RUBOUT 0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
RUBOUT 0000200 ERASE PRIN$1
RUBOUT 0000300 IF '$2'='1';RUBOUT $2,$3,$4,$5,$6,$7,$8,$9,$10
SET34 0000000 PROCDEF SET34
SET34 0000400 QUALIFY INLETT;AT 45(2);BRANCH 58
SET34 0000500 AT 6(1);DISPLAY DEL,COADD,AOAC(1),DELTAX;IF COADD<.0;STOP
SET34 0000600 QUALIFY ASORFS
SET34 0000800 AT 4(2);BRANCH 4(3)
SET34 0001000 AT 26(6);BRANCH 26(7)
SET34 0001100 QUALIFY SPALDCHI
SET34 0001200 AT 5(2);IF TW<.0;DISPLAY TW;STOP
SET34 0001300 DISPLAY '----->> DO ----->> GRABRER XX <----->'
SET38 0000000 PROCDEF SET38
SET38 0000100 QUALIFY CONVTA
SET38 0000200 SET ENGUI(123)=10.,ENGUI(231)=500.
SET61 0000000 PROCDEF SET61
SET61 0000100 QUALIFY CONVTA
SET61 0000200 SET ENGUI( 91)=10.,ENGUI( 92)=-10.,ENGUI(279)=15.,ENGUI(280)=25.
SET68 0000000 PROCDEF SET68
SET68 0000100 QUALIFY CONVTA
SET68 0000200 SET ENGUI(169)= 25.,ENGUI(170)= 25.,ENGUI(171)= 25.,ENGUI(176)=150.,ENGUI(235)= 10.,ENGUI(244)= 0.
SET68 0000300 SET ENGUI(343)=283.;DISPLAY ENGUI(169),ENGUI(170),ENGUI(171),ENGUI(176),ENGUI(235),ENGUI(244),ENGUI(343)
SET69 0000000 PROCDEF SET69
SET69 0000100 QUALIFY CONVTA
SET69 0000200 SET ENGUI(157)= 15.,ENGUI(157)= 25.,ENGUI(158)= 10.,ENGUI(162)= 10.,ENGUI(162)= 10.,ENGUI(168)= 15.
SET69 0000300 SET ENGUI(169)= 15.,ENGUI(170)= 15.,ENGUI(171)= 10.,ENGUI(174)= 10.,ENGUI(176)= 10.,ENGUI(177)= 15.
SET69 0000400 SET ENGUI(178)= 20.,ENGUI(179)= 25.,ENGUI(235)= 10.,ENGUI(244)= 0.,ENGUI(343)=283.
SET69 0000450 SET ENGUI(172)=10.
SET91 0000000 PROCDEF SET91
SET91 0000400 SET89
SET91 0000500 QUALIFY CONVTA
SET91 0000600 SET ENGUI(134)= 50.,ENGUI(136)= 75.,ENGUI(194)= 50.
SET92 0000000 PROCDEF SET92
SET92 0000100 SET89
SET92 0000200 SET91
SET92 0000300 QUALIFY CONVTA
SET92 0000400 SET ENGUI( 84)=25.
SET92 0000500 SET ENGUI(155)= 50.,ENGUI(157)= 15.,ENGUI(158)= 15.,ENGUI(160)= 50.,ENGUI(161)= 15.,ENGUI(162)= 15.
SET92 0000600 SET ENGUI(164)= 15.,ENGUI(165)= 50.,ENGUI(167)= 15.,ENGUI(171)= 50.,ENGUI(172)= 15.,ENGUI(174)= 15.
SET92 0000700 SET ENGUI(178)= 50.,ENGUI(179)= 15.,ENGUI(233)= 15.,ENGUI(234)= 50.,ENGUI(235)= 15.
SET92 0000800 SET ENGUI(237)= 50.,ENGUI(238)= 30.,ENGUI(239)= 50.,ENGUI(242)= 30.,ENGUI(243)= 50.
SET92 0000900 SET ENGUI(245)= 30.,ENGUI(246)= 50.,ENGUI(247)= 30.,ENGUI(249)= 50.,ENGUI(250)= 50.
SET96 0000000 PROCDEF SET96
SET96 0000100 QUALIFY ENPGM;SET ALPHA=3.
SET96 0000200 QUALIFY CONVTA;SET ENGUI(155)=20.,ENGUI(156)=20.
SET96 0000300 SET ENGUI(169)=20.,ENGUI(176)=15.
SETCMB 0000000 PROCDEF SETCMB
SETCMB 0000100 QUALIFY ACMBSTR;AT 70(6); DISPLAY VAL(11,1),VAL(11,2),VAL(11,3),VAL(11,4),WO,WF,OF,EQRAT,NVAL,XABS(IX)
SETCMB 0000200 AT 283;DISPLAY ISTA,ITER,ETAC,XABS(IX)
SETDRG 0000000 PROCDEF SETDRG
SETDRG 0000100 PARAM $R
SETDRG 0000200 DEFAULT SYSINX=E
SETDRG 0000300 PROCDEF COSR
SETDRG 0000400 INSERT LAST
SETDRG 0000500 QUALIFY ANOZ
SETDRG 0000600 AT 360(3);SET DRAGEX=-0.5*QOAC;DISPLAY DRAGEX,DRAGEX*PSIATM,'DRAGEX = -0.5*QO*AC'
SETDRG 0000700 _END
SETDRG 0000800 DEFAULT SYSINX=G
SETENG 0000000 PROCDEF SETENG
SETENG 0000100 PARAM $S1,$V1,$S2,$V2,$S3,$V3,$S4,$V4,$S5,$V5,$S6,$V6,$S7,$V7,$S8,$V8,$S9,$V9,$S10,$V10
SETENG 0000200 SET CONVTA,ENGUI($S1)=$V1
SETENG 0000300 IF '$S2'='1';SETENG $S2,$V2,$S3,$V3,$S4,$V4,$S5,$V5,$S6,$V6,$S7,$V7,$S8,$V8,$S9,$V9,$S10,$V10
SETFLOAD0000000 PROCDEF SETFLOAD
SETFLOAD0000100 QUALIFY EUFLOAD
SETFLOAD0000200 SET MVLIM(1,1)=-29.0
SETFLOAD0000300 SET MVLIM(2,1)=24.0
SETFLOAD0000400 SET MVLIM(1,2)=25.0
SETFLOAD0000500 SET MVLIM(2,2)=25.0
SETFLOAD0000600 SET MVLIM(1,3)=25.0
SETFLOAD0000700 SET MVLIM(2,3)=25.0
SETFLOAD0000800 SET B(1,1,1)=1.1347
SETFLOAD0000900 SET B(2,1,1)=-17.03
SETFLOAD0001000 SET B(1,2,1)=2.0
SETFLOAD0001100 SET B(2,2,1)=8.0
SETFLOAD0001200 SET B(1,3,1)=1.106
SETFLOAD0001300 SET B(2,3,1)=29.45
SETFLOAD0001400 SET B(1,1,2)=0.00888
SETFLOAD0001500 SET B(2,1,2)=-0.2222
SETFLOAD0001600 SET B(1,2,2)=0.007143
SETFLOAD0001700 SET B(2,2,2)=-0.178575
SETFLOAD0001800 SET B(1,3,2)=0.007143
SETFLOAD0001900 SET B(2,3,2)=-0.178575
SETFLOAD0002000 SET B(1,1,3)=0.008888
SETFLOAD0002100 SET B(2,1,3)=-0.2222
SETFLOAD0002200 SET B(1,2,3)=0.007143
SETFLOAD0002300 SET B(2,2,3)=-0.178575
SETFLOAD0002400 SET B(1,3,3)=0.007143
SETFLOAD0002500 SET B(2,3,3)=-0.178575
SETFTMP0000000 PROCDEF SETFTMP
SETFTMP0000050 PARAM $1
SETFTMP0000100 QUALIFY CHMIST
SETFTMP0000200 AT 14(2);DISPLAY XINJ,TTINJ,DELTAX,CONVTA,CH($1);STOP
SETNOZ1 0000000 PROCDEF SETNOZ1
SETNOZ1 0000100 QUALIFY NOZZL1
SETNOZ1 0000200 AT 0(1);DISPLAY XEQ(1),XEQ(2);IF XEQ(2)<SMALNO;SET XEQ(2)=2.0;DISPLAY XEQ(2)

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# APPENDIX B (Con't)

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SETPS 0000000 PROCDEF SETPS
SETPS 0000100 PARAM $CH1,$VAL1,$CH2,$VAL2,$CH3,$VAL3,$CH4,$VAL4,$CH5,$VAL5
SETPS 0000200 QUALIFY CONVTA
SETPS 0000300 AT 101(2);SET CH($CH1)=VAL1;DISPLAY CH($CH1)
SETPS 0000400 IF '$CH2'='';SETPS $CH2,$VAL2,$CH3,$VAL3,$CH4,$VAL4,$CH5,$VAL5
SETSONIC0000000 PROCDEF SETSONIC
SETSONIC0000001 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
SETSONIC0000002 DEFAULT SYSINX=E
SETSONIC0000003 PROCDEF TC$R-$1
SETSONIC0000004 INSERT LAST
SETSONIC0000005 QUALIFY ACMBSTR
SETSONIC0000006 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
SETSONIC0000007 _END
SETSONIC0000008 DEFAULT SYSINX=G
SETSONIC0000009 IF '$2'='';SETSONIC $R,$2,$3,$4,$5,$6,$7,$8,$9,$10
SETSTD 0000000 PROCDEF SETSTD
SETSTD 0000100 QUALIFY GSTRUTD
SETSTD 0000200 AT 0(5);SET DRAG=10.0/PSIATM,DDX=DRAG/DX;BRANCH 80(3)
SETTM4 0000000 PROCDEF SETTM4
SETTM4 0000100 PARAM $R,$1
SETTM4 0000200 DEFAULT SYSINX=E
SETTM4 0000300 PROCDEF COSR
SETTM4 0000400 INSERT LAST
SETTM4 0000500 QUALIFY CONVTA
SETTM4 0000600 AT 0;SET MV(65)=MV($1),HV(66)=MV($1);DISPLAY MV($1),MV(65),HV(66)
SETTM4 0000700 _END
SETTM4 0000800 DEFAULT SYSINX=G
SETTOPT 0000000 PROCDEF SETTOPT
SETTOPT 0000100 PARAM $0,$1,$2,$3,$4,$5
SETTOPT 0000200 DEFAULT SYSINX=E
SETTOPT 0000300 PROCDEF COS1
SETTOPT 0000400 INSERT LAST
SETTOPT 0000500 TUNNOPT $0
SETTOPT 0000600 _LIST LAST
SETTOPT 0000700 _END
SETTOPT 0000800 IF '$2'='';SETTOPT $0,$2,$3,$4,$5
SETTOPT 0000900 DEFAULT SYSINX=G
SHOWVAL 0000000 PROCDEF SHOWVAL
SHOWVAL 0000100 QUALIFY AINLETT
SHOWVAL 0000200 AT 2000(4);DISPLAY VAL(1,1):VAL(20,3)
STRUT 0000000 PROCDEF STRUT
STRUT 0000100 PARAM $S
STRUT 0000200 AT ACMBSTR.345,(2);DISPLAY ACMBSTR.DDXCOM;SET ACMBSTR.DDXCOM=$S.0/STRUTD.DX/STRUTD.PSIATM;DISPLAY ACMBSTR.DDXCOM
TC33-063000000 PROCDEF TC33-C63
TC33-063000001 QUALIFY AHXFER
TC33-063000002 AT 40(4);SET DTI=31.2,DTO=12.37,DTI=854.88,QTO=1109.71,QT=1964.59,TIIN=550.0,TIOUT=581.2,TOIN=550.0,TOOUT=562.37
TC33-063000003 QUALIFY ENGPGM
TC33-063000004 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC33-063000005 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC33-063000006 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC33-063000007 SET DORE=1.0
TC33-063000008 DISPLAY IFUEL,IGNON,DORE
TC33-121000000 PROCDEF TC33-121
TC33-121000001 QUALIFY AHXFER
TC33-121000002 AT 40(4);SET DTI=47.34,DTO=15.0,DTI=1297.12,QTO=1345.65,QT=2642.77,TIIN=550.0,TIOUT=597.34,TOIN=550.0,TOOUT=565.0
TC33-121000003 QUALIFY ENGPGM
TC33-121000004 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC33-121000005 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC33-121000006 SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC33-121000007 SET DORE=1.0
TC33-121000008 DISPLAY IFUEL,IGNON,DORE
TC33-129000000 PROCDEF TC33-129
TC33-129000001 QUALIFY AHXFER
TC33-129000002 AT 40(4);SET DTI=57.94,DTO=17.06,DTI=1587.56,QTO=1532.25,QT=3118.8,TIIN=550.0,TIOUT=607.94,TOIN=550.0,TOOUT=567.21
TC33-129000003 QUALIFY ENGPGM
TC33-129000004 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC33-129000005 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC33-129000006 SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC33-129000007 SET DORE=1.0
TC33-129000008 DISPLAY IFUEL,IGNON,DORE
TC33-136000000 PROCDEF TC33-136
TC33-136000001 QUALIFY AHXFER
TC33-136000002 AT 40(4);SET DTI=77.7,DTO=25.0,DTI=2130.9,QTO=2242.75,QT=4373.65,TIIN=550.0,TIOUT=627.7,TOIN=550.0,TOOUT=575.0
TC33-136000003 QUALIFY ENGPGM
TC33-136000004 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC33-136000005 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC33-136000006 SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC33-136000007 SET DORE=1.0
TC33-136000008 DISPLAY IFUEL,IGNON,DORE
TC34-075000000 PROCDEF TC34-075
TC34-075000001 QUALIFY AHXFER
TC34-075000002 AT 40(4);SET DTI=29.0,DTO=11.72,DTI=750.6,QT=1051.4,QT=1846.0,TIIN=550.0,TIOUT=579.0,TOIN=550.0,TOOUT=561.72
TC34-075000003 QUALIFY ENGPGM
TC34-075000004 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC34-075000005 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC34-075000006 SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC34-075000007 SET DORE=1.0
TC34-075000008 DISPLAY IFUEL,IGNON,DORE

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# Appendix B (Con't)

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TC34-C79C00C7C PROCDEF TC34-C79
TC34-C79C00C16C QUALIFY AHTXFER
TC34-C79C00C38C AT 40(4);SET DTI=34.35,DTO=16.21,DTI=932.97,DTQ=1454.2,DT=2387.17,TIIN=55C.C,TIOUT=584.05,TOIN=550.C,TOOUT=566.21
TC34-C79C00C49C AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC34-C79C00C50C QUALIFY ENGPGR
TC34-C79C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC34-C79C00C72C SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC34-C79C00C82C SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC34-C79C00C92C SET DORE=1.0
TC34-C79C00C10C DISPLAY IFUEL,IGNON,DORE
TC34-C82C00C0C PROCDEF TC34-C82
TC34-C82C00C10C QUALIFY AHTXFER
TC34-C82C00C30C AT 40(4);SET DTI=52.3,DTQ=21.9,DTI=1433.02,DTQ=1964.65,DT=3397.07,TIIN=55C.C,TIOUT=602.3,TOIN=550.C,TOOUT=571.0
TC34-C82C00C42C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC34-C82C00C52C QUALIFY ENGPGR
TC34-C82C00C62C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC34-C82C00C72C SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC34-C82C00C82C SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC34-C82C00C92C SET DORE=1.0
TC34-C82C00C10C DISPLAY IFUEL,IGNON,DORE
TC34-C131C00C0C PROCDEF TC34-C131
TC34-C131C00C10C QUALIFY AHTXFER
TC34-C131C00C30C AT 40(4);SET DTI=98.9,DTQ=32.9C,DTI=2709.66,DTQ=295C.84,DT=5666.7,TIIN=55C.C,TIOUT=648.0,TOIN=550.C,TOOUT=582.06
TC34-C131C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC34-C131C00C50C QUALIFY ENGPGR
TC34-C131C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC34-C131C00C70C SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC34-C131C00C80C SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC34-C131C00C90C SET DORE=1.0
TC34-C131C00C10C DISPLAY IFUEL,IGNON,DORE
TC34-C168C00C0C PROCDEF TC34-168
TC34-C168C00C10C QUALIFY AHTXFER
TC34-C168C00C30C AT 40(4);SET DTI=224.1,DTQ=42.36,DTI=3126.34,DTQ=3801.91,DT=6926.25,TIIN=55C.C,TIOUT=664.1,TOIN=550.C,TOOUT=592.31
TC34-C168C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC34-C168C00C50C QUALIFY ENGPGR
TC34-C168C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC34-C168C00C70C SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=0,IFUEL(8)=0
TC34-C168C00C80C SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC34-C168C00C90C SET DORE=1.0
TC34-C168C00C10C DISPLAY IFUEL,IGNON,DORE
TC34-C184C00C0C PROCDEF TC34-184
TC34-C184C00C10C QUALIFY AHTXFER
TC34-C184C00C30C AT 40(4);SET DTI=108.0,DTQ=44.63,DTI=2959.2,DTQ=4003.76,DT=6962.9F,TIIN=55C.C,TIOUT=658.0,TOIN=550.C,TOOUT=594.03
TC34-C184C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC34-C184C00C50C QUALIFY ENGPGR
TC34-C184C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC34-C184C00C70C SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=0,IFUEL(8)=0
TC34-C184C00C80C SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0
TC34-C184C00C90C SET DORE=1.0
TC34-C184C00C10C DISPLAY IFUEL,IGNON,DORE
TC36-C85C00C0C PROCDEF TC36-C85
TC36-C85C00C10C QUALIFY AHTXFER
TC36-C85C00C30C AT 40(4);SET DTI=32.9,DTQ=11.5,DTI=901.46,DTQ=1031.07,DT=1933.13,TIIN=55C.C,TIOUT=582.9,TOIN=550.C,TOOUT=561.5
TC36-C85C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC36-C85C00C50C QUALIFY ENGPGR
TC36-C85C00C60C SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC36-C85C00C70C SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC36-C85C00C80C SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC36-C85C00C90C SET DORE=1.0
TC36-C85C00C10C DISPLAY IFUEL,IGNON,DORE
TC36-C91C00C0C PROCDEF TC36-C91
TC36-C91C00C10C QUALIFY AHTXFER
TC36-C91C00C30C AT 40(4);SET DTI=36.2,DTQ=12.26,DTI=991.88,DTQ=1099.84,DT=2091.72,TIIN=550.C,TIOUT=586.2,TOIN=550.0,TOOUT=562.26
TC36-C91C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC36-C91C00C50C QUALIFY ENGPGR
TC36-C91C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC36-C91C00C70C SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC36-C91C00C80C SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC36-C91C00C90C SET DORE=1.0
TC36-C91C00C10C DISPLAY IFUEL,IGNON,DORE
TC36-C10C00C0C PROCDEF TC36-10C
TC36-C10C00C10C QUALIFY AHTXFER
TC36-C10C00C30C AT 40(4);SET
DTI=61.48,DTQ=24.53,DTI=1684.55,DTQ=2200.59,DT=3885.14,TIIN=55C.C,TIOUT=611.48,TOIN=550.C,TOOUT=574.53
TC36-C10C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC36-C10C00C50C QUALIFY ENGPGR
TC36-C10C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC36-C10C00C70C SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC36-C10C00C80C SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC36-C10C00C90C SET DORE=1.0
TC36-C10C00C10C DISPLAY IFUEL,IGNON,DORE
TC36-C113C00C0C PROCDEF TC36-113
TC36-C113C00C10C QUALIFY AHTXFER
TC36-C113C00C30C AT 40(4);SET DTI=92.5,DTQ=29.89,DTI=2534.5,DTQ=2681.43,DT=5215.93,TIIN=550.C,TIOUT=642.5,TOIN=550.0,TOOUT=579.89
TC36-C113C00C40C AT 40(4);DISPLAY DTI,DTQ,DTI,DTQ,DT,TIIN,TIOUT,TOIN,TOOUT
TC36-C113C00C50C QUALIFY ENGPGR
TC36-C113C00C60C SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC36-C113C00C70C SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC36-C113C00C80C SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC36-C113C00C90C SET DORE=1.0
TC36-C113C00C10C DISPLAY IFUEL,IGNON,DORE
TC36-C129C00C0C PROCDEF TC36-129
TC36-C129C00C10C QUALIFY AHTXFER
TC36-C129C00C30C AT 40(4);SET DTI=103.6,DTQ=33.18,DTI=2838.04,DTQ=2976.58,DT=5815.22,TIIN=550.C,TIOUT=653.0,TOIN=550.C,TOOUT=583.18

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# Appendix B (Con't)

TC36-1290000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1290000500 QUALIFY ENGPGM  
 TC36-1290000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC36-1290000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1290000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1290000900 SET DORE=1.0  
 TC36-1290001000 DISPLAY IFUEL,IGNON,DORE  
 TC36-1450000000 PROCDEF TC36-145  
 TC36-1450000100 QUALIFY AHTXFER  
 TC36-1450000300 AT 40(4);SET DTI=114.8,DTO=36.57,QTI=3145.52,QTO=3280.64,QT=6426.21,TIIN=550.C,TIOUT=664.8,TOIN=550.C,TOOUT=586.57  
 TC36-1450000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1450000500 QUALIFY ENGPGM  
 TC36-1450000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC36-1450000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1450000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1450000900 SET DORE=1.0  
 TC36-1450001000 DISPLAY IFUEL,IGNON,DORE  
 TC36-1670000000 PROCDEF TC36-167  
 TC36-1670000100 QUALIFY AHTXFER  
 TC36-1670000300 AT 40(4);SET DTI=31.5,DTO=11.94,QTI=863.1,QTO=1071.14,QT=1934.24,TIIN=550.0,TIOUT=581.5,TOIN=550.0,TOOUT=561.94  
 TC36-1670000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1670000500 QUALIFY ENGPGM  
 TC36-1670000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
 TC36-1670000700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1670000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1670000900 SET DORE=1.0  
 TC36-1670001000 DISPLAY IFUEL,IGNON,DORE  
 TC36-1790000000 PROCDEF TC36-179  
 TC36-1790000100 QUALIFY AHTXFER  
 TC36-1790000300 AT 40(4);SET DTI=38.4,DTO=14.13,QTI=1052.16,QTO=1267.6,QT=2319.76,TIIN=550.0,TIOUT=588.4,TOIN=550.0,TOOUT=564.13  
 TC36-1790000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1790000500 QUALIFY ENGPGM  
 TC36-1790000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC36-1790000700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1790000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1790000900 SET DORE=1.0  
 TC36-1790001000 DISPLAY IFUEL,IGNON,DORE  
 TC36-1860000000 PROCDEF TC36-186  
 TC36-1860000100 QUALIFY AHTXFER  
 TC36-1860000300 AT 40(4);SET DTI=39.9,DTO=13.03,QTI=1093.26,QTO=1168.92,QT=2262.18,TIIN=550.0,TIOUT=589.9,TOIN=550.0,TOOUT=563.03  
 TC36-1860000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1860000500 QUALIFY ENGPGM  
 TC36-1860000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
 TC36-1860000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1860000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1860000900 SET DORE=1.0  
 TC36-1860001000 DISPLAY IFUEL,IGNON,DORE  
 TC36-1890000000 PROCDEF TC36-189  
 TC36-1890000100 QUALIFY AHTXFER  
 TC36-1890000300 AT 40(4);SET DTI=43.9,DTO=21.02,QTI=1202.86,QTO=1885.7,QT=3088.56,TIIN=550.0,TIOUT=593.9,TOIN=550.0,TOOUT=571.02  
 TC36-1890000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1890000500 QUALIFY ENGPGM  
 TC36-1890000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC36-1890000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1890000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1890000900 SET DORE=1.0  
 TC36-1890001000 DISPLAY IFUEL,IGNON,DORE  
 TC36-1900000000 PROCDEF TC36-190  
 TC36-1900000100 QUALIFY AHTXFER  
 TC36-1900000300 AT 40(4);SET DTI=53.68,DTO=30.22,QTI=1470.83,QTO=2711.04,QT=4181.67,TIIN=550.0,TIOUT=603.68,TOIN=550.0,TOOUT=580.22  
 TC36-1900000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC36-1900000500 QUALIFY ENGPGM  
 TC36-1900000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC36-1900000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC36-1900000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC36-1900000900 SET DORE=1.0  
 TC36-1900001000 DISPLAY IFUEL,IGNON,DORE  
 TC52-0690000000 PROCDEF TC52-069  
 TC52-0690000100 QUALIFY AHTXFER  
 TC52-0690000200 AT 40(4);SET DTI=24.5,DTO=11.3,QTI=671.3,QTO=1013.72,QT=1685.02,TIIN=552.5,TIOUT=577.0,TOIN=552.5,TOOUT=563.8  
 TC52-0690000300 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC52-0690000400 QUALIFY ENGPGM  
 TC52-0690000500 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
 TC52-0690000600 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC52-0690000700 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC52-0690000800 DISPLAY IFUEL,IGNON,DORE  
 TC52-0760000000 PROCDEF TC52-076  
 TC52-0760000100 QUALIFY AHTXFER  
 TC52-0760000300 AT 40(4);SET DTI=41.5,DTO=22.4,QTI=1137.1,QTO=2009.5,QT=3146.6,TIIN=552.5,TIOUT=594.0,TOIN=552.5,TOOUT=574.9  
 TC52-0760000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC52-0760000500 QUALIFY ENGPGM  
 TC52-0760000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC52-0760000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
 TC52-0760000800 DISPLAY IFUEL,IGNON,DORE  
 TC52-0850000000 PROCDEF TC52-085  
 TC52-0850000100 QUALIFY AHTXFER  
 TC52-0850000300 AT 40(4);SET DTI=79.28,DTO=29.0,QTI=2172.27,QTO=2601.59,QT=4773.86,TIIN=552.5,TIOUT=631.78,TOIN=552.5,TOOUT=581.5  
 TC52-0850000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC52-0850000500 QUALIFY ENGPGM  
 TC52-0850000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC52-0850000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
 TC52-0850000800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC52-0850000900 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3



# APPENDIX B (Con't)

TC52-0850000800 DISPLAY IFUEL,IGNON,DORE  
 TC52-0950000000 PROCDEF TC52-095  
 TC52-0950000100 QUALIFY AHTXFER  
 TC52-0950000300 AT 40(4);SET DTI=85.67,DTO=30.5,QT1=2347.36,QTO=2736.16,QT=5083.5,TIIN=552.5,TIOUT=638.17,TOIN=552.5,TOOUT=563.0  
 TC52-0950000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC52-0950000500 QUALIFY ENGPGM  
 TC52-0950000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC52-0950000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC52-0950000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
 TC52-0950000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-0660000000 PROCDEF TC54-066  
 TC54-0660000100 QUALIFY AHTXFER  
 TC54-0660000300 AT 40(4);SET DTI=27.37,DTO=11.81,QT1=749.9,QTO=1059.48,QT=1809.41,TIIN=555.0,TIOUT=582.37,TOIN=555.0,TOOUT=566.81  
 TC54-0660000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-0660000500 QUALIFY ENGPGM  
 TC54-0660000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
 TC54-0660000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-0660000700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-0660000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-0980000000 PROCDEF TC54-098  
 TC54-0980000100 QUALIFY AHTXFER  
 TC54-0980000300 AT 40(4);SET DTI=75.0,DTO=34.0,QT1=2055.0,QTO=3050.1,QT=5105.1,TIIN=555.0,TIOUT=630.0,TOIN=555.0,TOOUT=589.0  
 TC54-0980000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-0980000500 QUALIFY ENGPGM  
 TC54-0980000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-0980000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-0980000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-0980000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-1050000000 PROCDEF TC54-105  
 TC54-1050000100 QUALIFY AHTXFER  
 TC54-1050000300 AT 40(4);SET DTI=45.44,DTO=24.6,QT1=1245.06,QTO=2206.87,QT=3451.9,TIIN=555.0,TIOUT=600.44,TOIN=555.0,TOOUT=579.6  
 TC54-1050000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-1050000500 QUALIFY ENGPGM  
 TC54-1050000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-1050000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-1050000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-1050000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-1150000000 PROCDEF TC54-115  
 TC54-1150000100 QUALIFY AHTXFER  
 TC54-1150000300 AT 40(4);SET DTI=69.0,DTO=30.6,QT1=1890.6,QTO=2745.13,QT=4635.7,TIIN=555.0,TIOUT=624.0,TOIN=555.0,TOOUT=585.6  
 TC54-1150000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-1150000500 QUALIFY ENGPGM  
 TC54-1150000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-1150000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-1150000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-1150000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-1390000000 PROCDEF TC54-139  
 TC54-1390000100 QUALIFY AHTXFER  
 TC54-1390000300 AT 40(4);SET DTI=72.0,DTO=29.4,QT1=1972.8,QTO=2657.4,QT=4610.2,TIIN=557.0,TIOUT=629.0,TOIN=557.0,TOOUT=586.4  
 TC54-1390000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-1390000500 QUALIFY ENGPGM  
 TC54-1390000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-1390000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-1390000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-1390000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-1540000000 PROCDEF TC54-154  
 TC54-1540000100 QUALIFY AHTXFER  
 TC54-1540000300 AT 40(4);SET DTI=78.8,DTO=33.0,QT1=2159.12,QTO=2960.4,QT=5119.5,TIIN=559.2,TIOUT=638.0,TOIN=559.2,TOOUT=592.2  
 TC54-1540000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-1540000500 QUALIFY ENGPGM  
 TC54-1540000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-1540000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-1540000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-1540000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-1740000000 PROCDEF TC54-174  
 TC54-1740000100 QUALIFY AHTXFER  
 TC54-1740000300 AT 40(4);SET DTI=77.8,DTO=35.3,QT1=2131.7,QTO=3166.7,QT=5298.5,TIIN=559.2,TIOUT=637.0,TOIN=559.2,TOOUT=594.5  
 TC54-1740000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-1740000500 QUALIFY ENGPGM  
 TC54-1740000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-1740000650 SET IGNON(1)=1,IGNON(2)=1,IGNON(3)=0,DORE=1.0  
 TC54-1740000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-1740000750 SET IGNON(1)=1,IGNON(2)=1  
 TC54-1740000800 DISPLAY IFUEL,IGNON,DORE  
 TC54-2040000000 PROCDEF TC54-204  
 TC54-2040000100 QUALIFY AHTXFER  
 TC54-2040000300 AT 40(4);SET DTI=75.1,DTO=35.22,QT1=2057.74,QTO=3166.7,QT=5224.5,TIIN=563.6,TIOUT=638.7,TOIN=563.6,TOOUT=598.82  
 TC54-2040000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC54-2040000500 QUALIFY ENGPGM  
 TC54-2040000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC54-2040000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC54-2040000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC54-2040000800 DISPLAY IFUEL,IGNON,DORE  
 TC57-0780000000 PROCDEF TC57-078  
 TC57-0780000100 QUALIFY AHTXFER  
 TC57-0780000300 AT 40(4);SET DTI=29.69,DTO=12.92,QT1=813.5,QTO=1159.05,QT=1972.56,TIIN=553.0,TIOUT=542.69,TOIN=553.0,TOOUT=565.92  
 TC57-0780000400 AT 40(4);DISPLAY DTI,DTO,QT1,QTO,QT,TIIN,TIOUT,TOIN,TOOUT  
 TC57-0780000500 QUALIFY ENGPGM  
 TC57-0780000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
 TC57-0780000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0  
 TC57-0780000700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC57-0780000800 DISPLAY IFUEL,IGNON,DORE  
 TC57-0920000000 PROCDEF TC57-092  
 TC57-0920000100 QUALIFY AHTXFER



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# APPENDIX B (Con't)

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C57-0920C0G300 AT 40(4);SET DTI=81.32,DTO=36.1,DTI=2228.17,DTO=3238.53,DT=546.70,TIIN=553.6,TIOUT=634.92,TOIN=553.6,TOOUT=589.7
C57-0920C0G400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C57-0920C0G500 QUALIFY ENGPGM
C57-0920C0G600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
C57-0920C0G650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C57-0920C0G700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C57-0920C0G800 DISPLAY IFUEL,IGNON,DORE
C57-1220C0C000 PROCDEF TC57-122
C57-1220C0C100 QUALIFY AHTXFER
C57-1220C0C300 AT 40(4);SET DTI=86.96,DTO=37.5,DTI=2382.7,DTO=3364.13,DT=5746.83,TIIN=555.0,TIOUT=641.96,TOIN=555.0,TOOUT=592.5
C57-1220C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C57-1220C0C500 QUALIFY ENGPGM
C57-1220C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
C57-1220C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C57-1220C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C57-1220C0C800 DISPLAY IFUEL,IGNON,DORE
C57-1220C0C900 PROCDEF TC57-122
C57-1220C0C950 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C57-1220C0C980 DISPLAY IFUEL,IGNON,DORE
C57-1560C0C000 PROCDEF TC57-156
C57-1560C0C100 QUALIFY AHTXFER
C57-1560C0C300 AT 40(4);SET
C57-1560C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C57-1560C0C500 QUALIFY ENGPGM
C57-1560C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
C57-1560C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C57-1560C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C57-1560C0C800 DISPLAY IFUEL,IGNON,DORE
C57-1810C0C000 PROCDEF TC57-181
C57-1810C0C100 QUALIFY AHTXFER
C57-1810C0C300 AT 40(4);SET DTI=81.83,DTO=35.0,DTI=2242.14,DTO=3139.85,DT=5381.00,TIIN=561.0,TIOUT=642.83,TOIN=561.0,TOOUT=596.0
C57-1810C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C57-1810C0C500 QUALIFY ENGPGM
C57-1810C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
C57-1810C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C57-1810C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C57-1810C0C800 DISPLAY IFUEL,IGNON,DORE
C60-0550C0C000 PROCDEF TC60-055
C60-0550C0C100 QUALIFY AHTXFER
C60-0550C0C300 AT 40(4);SET DTI=28.0,DTO=12.7,DTI=767.2,DTO=1139.32,DT=1996.52,TIIN=557.5,TIOUT=585.5,TOIN=547.5,TOOUT=560.2
C60-0550C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C60-0550C0C500 QUALIFY ENGPGM
C60-0550C0C600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
C60-0550C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C60-0550C0C700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C60-0550C0C800 DISPLAY IFUEL,IGNON,DORE
C60-0800C0C000 PROCDEF TC60-080
C60-0800C0C100 QUALIFY AHTXFER
C60-0800C0C300 AT 40(4);SET DTI=74.3,DTO=34.2,DTI=2035.82,DTO=3068.08,DT=5103.9,TIIN=558.2,TIOUT=632.5,TOIN=558.2,TOOUT=592.4
C60-0800C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C60-0800C0C500 QUALIFY ENGPGM
C60-0800C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
C60-0800C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C60-0800C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C60-0800C0C800 DISPLAY IFUEL,IGNON,DORE
C60-0800C0C900 PROCDEF TC60-089
C60-0800C0C100 QUALIFY AHTXFER
C60-0800C0C300 AT 40(4);SET DTI=78.6,DTO=34.3,DTI=2159.12,DTO=3077.05,DT=5236.17,TIIN=558.2,TIOUT=637.0,TOIN=558.2,TOOUT=592.5
C60-0800C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C60-0800C0C500 QUALIFY ENGPGM
C60-0800C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
C60-0800C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C60-0800C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C60-0800C0C800 DISPLAY IFUEL,IGNON,DORE
C60-1070C0C000 PROCDEF TC60-107
C60-1070C0C100 QUALIFY AHTXFER
C60-1070C0C300 AT 40(4);SET DTI=72.3,DTO=33.0,DTI=1981.02,DTO=2960.43,DT=4941.45,TIIN=558.7,TIOUT=631.0,TOIN=558.7,TOOUT=591.7
C60-1070C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C60-1070C0C500 QUALIFY ENGPGM
C60-1070C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
C60-1070C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C60-1070C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C60-1070C0C800 DISPLAY IFUEL,IGNON,DORE
C60-1300C0C000 PROCDEF TC60-130
C60-1300C0C100 QUALIFY AHTXFER
C60-1300C0C300 AT 40(4);SET DTI=85.0,DTO=32.4,DTI=2329.0,DTO=2906.6,DT=5235.6,TIIN=560.0,TIOUT=645.0,TOIN=560.0,TOOUT=592.4
C60-1300C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C60-1300C0C500 QUALIFY ENGPGM
C60-1300C0C600 SET IFUEL(1)=1,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
C60-1300C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C60-1300C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C60-1300C0C800 DISPLAY IFUEL,IGNON,DORE
C60-1300C0C900 PROCDEF TC60-138
C60-1300C0C100 QUALIFY AHTXFER
C60-1300C0C300 AT 40(4);SET DTI=80.1,DTO=34.7,DTI=2194.74,DTO=3112.94,DT=5397.08,TIIN=561.5,TIOUT=641.6,TOIN=561.5,TOOUT=596.2
C60-1300C0C400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
C60-1300C0C500 QUALIFY ENGPGM
C60-1300C0C600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
C60-1300C0C650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
C60-1300C0C700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
C60-1300C0C800 DISPLAY IFUEL,IGNON,DORE
C60-1500C0C000 PROCDEF TC60-150
C60-1500C0C100 QUALIFY AHTXFER
C60-1500C0C300 AT 40(4);SET DTI=70.49,DTO=36.19,DTI=1931.43,DTO=3241.6,DT=5178.93,TIIN=562.7,TIOUT=633.19,TOIN=562.7,TOOUT=598.89

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# APPENDIX B (Con't)

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TC6C-1500000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC6C-1500000500 QUALIFY ENPGM
TC6C-1500000600 SET IFUEL(1)=0,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC6C-1500000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC6C-1500000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC6C-1500000800 DISPLAY IFUEL,IGNON,DORE
TC6C-1500000900 PROCDEF TC6C-159
TC6C-1590000100 QUALIFY AHTXFER
TC6C-1590000300 AT 40(4);SET DTI=71.68,DTO=37.5,QTI=1964.03,QTO=334.13,QT=5328.18,TIIN=564.0,TIOUT=635.68,TOIN=564.0,TOOUT=601.5
TC6C-1590000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC6C-1590000500 QUALIFY ENPGM
TC6C-1590000600 SET IFUEL(1)=0,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC6C-1590000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC6C-1590000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC6C-1590000800 DISPLAY IFUEL,IGNON,DORE
TC6C-1590000900 PROCDEF TC6C-169
TC6C-1690000100 QUALIFY AHTXFER
TC6C-1690000300 AT 40(4);SET DTI=72.5,DTO=27.1,QTI=1986.5,QTO=2431.14,QT=4417.04,TIIN=563.5,TIOUT=636.0,TOIN=563.5,TOOUT=590.6
TC6C-1690000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC6C-1690000500 QUALIFY ENPGM
TC6C-1690000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC6C-1690000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC6C-1690000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC6C-1690000800 DISPLAY IFUEL,IGNON,DORE
TC6C-1690000900 PROCDEF TC6C-176
TC6C-1760000100 QUALIFY AHTXFER
TC6C-1760000300 AT 40(4);SET DTI=73.4,DTO=27.2,QTI=2011.16,DTO=2440.11,QT=4451.27,TIIN=564.0,TIOUT=636.0,TOIN=564.0,TOOUT=591.8
TC6C-1760000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC6C-1760000500 QUALIFY ENPGM
TC6C-1760000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC6C-1760000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC6C-1760000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC6C-1760000800 DISPLAY IFUEL,IGNON,DORE
TC6C-1760000900 PROCDEF TC61-088
TC61-0880000100 QUALIFY AHTXFER
TC61-0880000300 AT 40(4);SET DTI=30.0,DTO=12.8,QTI=822.0,QTO=1148.3,QT=1970.2,TIIN=561.0,TIOUT=591.0,TOIN=561.0,TOOUT=573.8
TC61-0880000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-0880000500 QUALIFY ENPGM
TC61-0880000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC61-0880000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC61-0880000700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC61-0880000800 DISPLAY IFUEL,IGNON,DORE
TC61-0880000900 PROCDEF TC61-110
TC61-1100000100 QUALIFY AHTXFER
TC61-1100000300 AT 40(4);SET DTI=63.0,DTO=23.75,QTI=1726.2,QTO=2130.6,QT=3856.8,TIIN=562.0,TIOUT=625.0,TOIN=562.0,TOOUT=565.75
TC61-1100000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-1100000500 QUALIFY ENPGM
TC61-1100000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC61-1100000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC61-1100000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC61-1100000800 DISPLAY IFUEL,IGNON,DORE
TC61-1100000900 PROCDEF TC61-118
TC61-1180000100 QUALIFY AHTXFER
TC61-1180000300 AT 40(4);SET DTI=69.0,DTO=28.2,QTI=1890.6,QTO=2529.8,QT=4420.4,TIIN=561.0,TIOUT=636.0,TOIN=561.0,TOOUT=589.2
TC61-1180000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-1180000500 QUALIFY ENPGM
TC61-1180000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC61-1180000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC61-1180000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC61-1180000800 DISPLAY IFUEL,IGNON,DORE
TC61-1180000900 PROCDEF TC61-125
TC61-1250000100 QUALIFY AHTXFER
TC61-1250000300 AT 40(4);SET DTI=72.0,DTO=32.8,QTI=1972.8,QTO=2442.49,QT=4915.20,TIIN=562.0,TIOUT=634.0,TOIN=562.0,TOOUT=594.8
TC61-1250000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-1250000500 QUALIFY ENPGM
TC61-1250000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC61-1250000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC61-1250000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC61-1250000800 DISPLAY IFUEL,IGNON,DORE
TC61-1250000900 PROCDEF TC61-136
TC61-1360000100 QUALIFY AHTXFER
TC61-1360000300 AT 40(4);SET DTI=72.5,DTO=35.1,QTI=1986.5,QTO=3148.82,QT=5135.32,TIIN=562.0,TIOUT=634.5,TOIN=560.0,TOOUT=595.1
TC61-1360000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-1360000500 QUALIFY ENPGM
TC61-1360000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC61-1360000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC61-1360000700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC61-1360000800 DISPLAY IFUEL,IGNON,DORE
TC61-1360000900 PROCDEF TC61-146
TC61-1460000100 QUALIFY AHTXFER
TC61-1460000300 AT 40(4);SET DTI=29.5,DTO=11.33,QTI=808.3,QTO=1016.4,QT=1824.71,TIIN=562.2,TIOUT=610.7,TOIN=562.2,TOOUT=575.5
TC61-1460000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-1460000500 QUALIFY ENPGM
TC61-1460000600 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC61-1460000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0
TC61-1460000700 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC61-1460000800 DISPLAY IFUEL,IGNON,DORE
TC61-1460000900 PROCDEF TC61-160
TC61-1600000100 QUALIFY AHTXFER
TC61-1600000300 AT 40(4);SET DTI=46.8,DTO=18.5,QTI=1282.3,QTO=1659.64,QT=2941.96,TIIN=563.8,TIOUT=610.0,TOIN=563.8,TOOUT=582.3
TC61-1600000400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC61-1600000500 QUALIFY ENPGM
TC61-1600000600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC61-1600000650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=1.0

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# APPENDIX B (Con't)

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TC61-1600000700 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC61-1600000800 DISPLAY IFUEL, IGNON, DORE
TC61-1600000900 PROCDEF TC61-163
TC61-1600001000 QUALIFY AHTXFER
TC61-1600001100 AT 40(4);SET DTI=49.5, DTO=19.5, QTI=1315.2, QTO=1749.3, QT=3964.55, TIIN=562.5, TIOU=612.0, TOIN=562.5, TOOU=582.2
TC61-1600001200 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC61-1600001300 QUALIFY ENGPGR
TC61-1600001400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC61-1600001500 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC61-1600001600 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC61-1600001700 DISPLAY IFUEL, IGNON, DORE
TC61-1600001800 PROCDEF TC61-169
TC61-1600001900 QUALIFY AHTXFER
TC61-1600002000 AT 40(4);SET DTI=62.5, DTO=25.25, QTI=1712.5, QTO=2265.18, QT=3977.68, TIIN=564.0, TIOU=626.5, TOIN=564.0, TOOU=589.25
TC61-1600002100 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC61-1600002200 QUALIFY ENGPGR
TC61-1600002300 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC61-1600002400 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC61-1600002500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC61-1600002600 DISPLAY IFUEL, IGNON, DORE
TC61-1600002700 PROCDEF TC61-161
TC61-1600002800 QUALIFY AHTXFER
TC61-1600002900 AT 40(4);SET DTI=67.0, DTO=31.25, QTI=1835.8, QTO=2803.4, QT=4639.2, TIIN=565.0, TIOU=632.0, TOIN=565.0, TOOU=596.25
TC61-1600003000 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC61-1600003100 QUALIFY ENGPGR
TC61-1600003200 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC61-1600003300 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC61-1600003400 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC61-1600003500 DISPLAY IFUEL, IGNON, DORE
TC61-1600003600 PROCDEF TC61-193
TC61-1600003700 QUALIFY AHTXFER
TC61-1600003800 AT 40(4);SET DTI=68.0, DTO=35.65, QTI=1863.2, QTO=3018.74, QT=4821.94, TIIN=566.0, TIOU=634.0, TOIN=566.0, TOOU=599.65
TC61-1600003900 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC61-1600004000 QUALIFY ENGPGR
TC61-1600004100 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC61-1600004200 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC61-1600004300 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC61-1600004400 DISPLAY IFUEL, IGNON, DORE
TC61-1600004500 PROCDEF TC63-264
TC63-0640000100 QUALIFY AHTXFER
TC63-0640000200 AT 40(4);SET DTI=32.8, DTO=14.88, QTI=898.7, QTO=1334.88, QT=2233.6, TIIN=560.2, TIOU=593.0, TOIN=560.2, TOOU=575.9
TC63-0640000300 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC63-0640000400 QUALIFY ENGPGR
TC63-0640000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC63-0640000600 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC63-0640000700 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC63-0640000800 DISPLAY IFUEL, IGNON, DORE
TC63-0640000900 PROCDEF TC63-271
TC63-0640001000 QUALIFY AHTXFER
TC63-0640001100 AT 40(4);SET DTI=73.3, DTO=33.0, QTI=2028.42, QTO=2960.43, QT=4968.85, TIIN=559.7, TIOU=633.0, TOIN=559.7, TOOU=592.7
TC63-0640001200 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC63-0640001300 QUALIFY ENGPGR
TC63-0640001400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC63-0640001500 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC63-0640001600 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC63-0640001700 DISPLAY IFUEL, IGNON, DORE
TC63-0640001800 PROCDEF TC63-298
TC63-0640001900 QUALIFY AHTXFER
TC63-0640002000 AT 40(4);SET DTI=86.8, DTO=40.65, QTI=2378.32, QTO=3646.71, QT=6025.03, TIIN=560.2, TIOU=647.0, TOIN=560.2, TOOU=600.85
TC63-0640002100 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC63-0640002200 QUALIFY ENGPGR
TC63-0640002300 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC63-0640002400 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC63-0640002500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC63-0640002600 DISPLAY IFUEL, IGNON, DORE
TC63-0640002700 PROCDEF TC63-134
TC63-0640002800 QUALIFY AHTXFER
TC63-0640002900 AT 40(4);SET DTI=25.8, DTO=9.85, QTI=706.0, QTO=883.6, QT=1590.56, TIIN=561.2, TIOU=587.0, TOIN=561.2, TOOU=571.05
TC63-0640003000 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC63-0640003100 QUALIFY ENGPGR
TC63-0640003200 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC63-0640003300 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC63-0640003400 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC63-0640003500 DISPLAY IFUEL, IGNON, DORE
TC63-0640003600 PROCDEF TC63-163
TC63-0640003700 QUALIFY AHTXFER
TC63-0640003800 AT 40(4);SET DTI=53.0, DTO=23.75, QTI=1452.2, QTO=2130.6, QT=3582.8, TIIN=565.0, TIOU=618.0, TOIN=565.0, TOOU=582.75
TC63-0640003900 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC63-0640004000 QUALIFY ENGPGR
TC63-0640004100 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC63-0640004200 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=1.0
TC63-0640004300 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC63-0640004400 DISPLAY IFUEL, IGNON, DORE
TC63-0640004500 PROCDEF TC64-058
TC64-0580000100 QUALIFY AHTXFER
TC64-0580000200 AT 40(4);SET DTI=29.5, DTO=11.9, QTI=808.3, QTO=1067.5, QT=1875.8, TIIN=555.5, TIOU=585.0, TOIN=555.5, TOOU=567.4
TC64-0580000300 AT 40(4);DISPLAY DTI, DTO, QTI, QTO, QT, TIIN, TIOU, TOIN, TOOU
TC64-0580000400 QUALIFY ENGPGR
TC64-0580000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0, IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC64-0580000600 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0, DORE=2.0
TC64-0580000700 DISPLAY IFUEL, IGNON, DORE
TC64-0580000800 PROCDEF TC64-071
TC64-0580000900 QUALIFY AHTXFER

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# APPENDIX B (Con't)

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TC64-0710000000 AT 40(4);SET DTI=64.0,DTO=33.0,DTI=1753.6,DTQ=2960.4,DT=4714.03,TIIN=556.0,TIOUT=620.0,TOIN=556.0,TOOUT=589.2
TC64-0710000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC64-0710000000 QUALIFY ENGPGM
TC64-0710000000 SET IFUEL(1)=0,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4,IFUEL(5)=1,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC64-0710000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC64-0710000000 DISPLAY IFUEL,IGNON,DORE
TC64-1090000000 PROCDEF TC64-109
TC64-1090000000 QUALIFY AHTXFER
TC64-1090000000 AT 40(4);SET DTI=38.5,DTO=28.65,DTI=1054.9,DTQ=257.19,DT=3625.7,DTIIN=556.5,DTIOUT=595.0,TOIN=556.5,TOOUT=585.15
TC64-1090000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC64-1090000000 QUALIFY ENGPGM
TC64-1090000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC64-1090000000 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC64-1090000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC64-1090000000 DISPLAY IFUEL,IGNON,DORE
TC64-1090000000 QUALIFY ACIBSTR
TC64-1090000000 AT 35(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC64-1510000000 PROCDEF TC64-151
TC64-1510000000 QUALIFY AHTXFER
TC64-1510000000 AT 40(4);SET DTI=71.7,DTO=39.1,DTI=1964.5,DTQ=3507.6,DT=5472.24,TIIN=539.3,TIOUT=631.0,TOIN=539.3,TOOUT=578.4
TC64-1510000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC64-1510000000 QUALIFY ENGPGM
TC64-1510000000 SET IFUEL(1)=0,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4,IFUEL(5)=1,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC64-1510000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC64-1510000000 DISPLAY IFUEL,IGNON,DORE
TC64-1750000000 PROCDEF TC64-175
TC64-1750000000 QUALIFY AHTXFER
TC64-1750000000 AT 40(4);SET DTI=48.0,DTO=36.1,DTI=1315.2,DTQ=3238.53,DT=4553.73,TIIN=563.0,TIOUT=611.0,TOIN=563.0,TOOUT=599.1
TC64-1750000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC64-1750000000 QUALIFY ENGPGM
TC64-1750000000 SET IFUEL(1)=0,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC64-1750000000 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC64-1750000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC64-1750000000 DISPLAY IFUEL,IGNON,DORE
TC64-1750000000 QUALIFY ACIBSTR
TC64-1750000000 AT 35(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC64-2110000000 PROCDEF TC64-211
TC64-2110000000 QUALIFY AHTXFER
TC64-2110000000 AT 40(4);SET DTI=70.8,DTO=38.25,DTI=1939.92,DTQ=3431.4,DT=5371.32,TIIN=565.2,TIOUT=636.0,TOIN=565.2,TOOUT=603.45
TC64-2110000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC64-2110000000 QUALIFY ENGPGM
TC64-2110000000 SET IFUEL(1)=0,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4,IFUEL(5)=1,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC64-2110000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC64-2110000000 DISPLAY IFUEL,IGNON,DORE
TC65-0600000000 PROCDEF TC65-060
TC65-0600000000 QUALIFY AHTXFER
TC65-0600000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0600000000 AT 40(4);SET
DTI=35.88,DTO=12.51,DTI=983.11,DTQ=1122.27,DT=2105.38,TIIN=548.56,TIOUT=584.44,TOIN=548.56,TOOUT=561.07
TC65-0600000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0600000000 QUALIFY ENGPGM
TC65-0600000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC65-0600000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-0600000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0600000000 DISPLAY IFUEL,IGNON,DORE
TC65-0600000000 QUALIFY ANOZ
TC65-0600000000 AT 360(3);SET DRAGEX=(1.0/PSIATM)*(-106.0);DISPLAY DRAGEX
TC65-0600000000 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-0720000000 PROCDEF TC65-072
TC65-0720000000 QUALIFY AHTXFER
TC65-0720000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0720000000 AT 40(4);SET
DTI=40.91,DTO=13.61,DTI=1120.99,DTQ=1220.95,DT=2341.89,TIIN=547.89,TIOUT=588.8,TOIN=547.89,TOOUT=561.5
TC65-0720000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0720000000 QUALIFY ENGPGM
TC65-0720000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC65-0720000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-0720000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0720000000 DISPLAY IFUEL,IGNON,DORE
TC65-0720000000 QUALIFY ANOZ
TC65-0720000000 AT 360(3);SET DRAGEX=(1.0/PSIATM)*(-107.0);DISPLAY DRAGEX
TC65-0720000000 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-0780000000 PROCDEF TC65-078
TC65-0780000000 QUALIFY AHTXFER
TC65-0780000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0780000000 AT 40(4);SET
DTI=64.69,DTO=22.73,DTI=1772.51,DTQ=2039.11,DT=3811.61,TIIN=548.67,TIOUT=613.36,TOIN=548.67,TOOUT=571.4
TC65-0780000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0780000000 QUALIFY ENGPGM
TC65-0780000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC65-0780000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-0780000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0780000000 DISPLAY IFUEL,IGNON,DORE
TC65-0780000000 QUALIFY ANOZ
TC65-0780000000 AT 360(3);SET DRAGEX=(1.0/PSIATM)*(-108.0);DISPLAY DRAGEX
TC65-0780000000 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-0960000000 PROCDEF TC65-096
TC65-0960000000 QUALIFY AHTXFER
TC65-0960000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0960000000 AT 40(4);SET
DTI=99.8,DTO=32.31,DTI=2734.52,DTQ=2898.53,DT=5633.05,TIIN=548.45,TIOUT=646.25,TOIN=548.45,TOOUT=580.76
TC65-0960000000 AT 40(4);DISPLAY DTI,DTO,DTI,DTQ,DT,DTIIN,TIOUT,TOIN,TOOUT
TC65-0960000000 QUALIFY ENGPGM
TC65-0960000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4

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# APPENDIX B (Con't)

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TC65-1360012650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-1360030700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-1360032800 DISPLAY IFUEL,IGNON,DORE
TC65-0960031000 QUALIFY ANOZ
TC65-0960031100 AT 360(3);SET DRAGEX= (1.0/PSIATM)*(-1200.0);DISPLAY DRAGEX
TC65-0960031200 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-1020030000 PROCDEF TC65-102
TC65-1020030100 QUALIFY AHTXFER
TC65-1020030200 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC65-1020030300 AT 40(4);SET
DTI=104.23,DTO=35.96,QTI=2855.9,QTO=3225.97,QT=6081.87,TIIN=549.11,TIOUT=653.34,TOIN=549.11,TOOUT=585.07
TC65-1020030400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC65-1020030500 QUALIFY ENGPGM
TC65-1020030600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC65-1020030650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-1020030700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-1020030800 DISPLAY IFUEL,IGNON,DORE
TC65-1020030900 QUALIFY ANOZ
TC65-1020031000 AT 360(3);SET DRAGEX= (1.0/PSIATM)*(-1575.0);DISPLAY DRAGEX
TC65-1020031100 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-1020031200 PROCDEF TC65-120
TC65-1200030000 QUALIFY AHTXFER
TC65-1200030100 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC65-1200030200 AT 40(4);SET
DTI=92.5,DTO=34.75,QTI=2534.5,QTO=3117.42,QT=5651.92,TIIN=550.44,TIOUT=642.94,TOIN=550.44,TOOUT=585.19
TC65-1200030300 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC65-1200030400 QUALIFY ENGPGM
TC65-1200030500 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC65-1200030650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-1200030700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-1200030800 DISPLAY IFUEL,IGNON,DORE
TC65-1200030900 QUALIFY ANOZ
TC65-1200031000 AT 360(3);SET DRAGEX= (1.0/PSIATM)*(-1500.0);DISPLAY DRAGEX
TC65-1200031200 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-1390030000 PROCDEF TC65-139
TC65-1390030100 QUALIFY AHTXFER
TC65-1390030200 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC65-1390030300 AT 40(4);SET DTI=92.85,DTO=32.05,QTI=2544.09,QTO=2875.21,QT=5419.3,TIIN=551.65,TIOUT=644.5,TOIN=551.65,TOOUT=583.7
TC65-1390030400 AT 40(4);DISPLAY DTI,DTO,QTI,QTO,QT,TIIN,TIOUT,TOIN,TOOUT
TC65-1390030500 QUALIFY ENGPGM
TC65-1390030600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC65-1390030650 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0,DORE=2.0
TC65-1390030700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-1390030800 DISPLAY IFUEL,IGNON,DORE
TC65-1390030900 QUALIFY ANOZ
TC65-1390031000 AT 360(3);SET DRAGEX= (1.0/PSIATM)*(-1560.0);DISPLAY DRAGEX
TC65-1390031200 DISPLAY 'NOTE: DRAGEX SET IN THIS RUN - REMEMBER THE EXTRA REMOVE'
TC65-0690030000 PROCDEF TC69-069
TC65-0690030100 QUALIFY AHTXFER
TC65-0690030200 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=549.88,TIOUT=584.77,TOIN=549.88,TOOUT=562.27
TC65-0690030300 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QTI,TOIN,TOOUT,DTO,QTO,QT
TC65-0690030400 QUALIFY ENGPGM
TC65-0690030500 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC65-0690030600 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0690030700 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC65-0690030800 SET DORE=2.0
TC65-0690030900 DISPLAY IFUEL,IGNON,DORE
TC65-0690031000 QUALIFY ANOZ
TC65-0690031100 AT 360(3);SET DRAGEX=-1075.0/PSIATM;DISPLAY DRAGEX*PSIATM,DRAGEX,'DRAGEX INPUT THIS RUN'
TC65-0710000000 PROCDEF TC69-071
TC65-0710000100 QUALIFY AHTXFER
TC65-0710000150 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=550.37,TIOUT=584.88,TOIN=550.37,TOOUT=564.8
TC65-0710000200 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QTI,TOIN,TOOUT,DTO,QTO,QT
TC65-0710000300 QUALIFY ENGPGM
TC65-0710000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC65-0710000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0710000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC65-0710000700 SET DORE=2.0
TC65-0710000800 DISPLAY IFUEL,IGNON,DORE
TC65-0710000900 QUALIFY ANOZ
TC65-0710001000 AT 360(3);SET DRAGEX=-1075.0/PSIATM;DISPLAY DRAGEX*PSIATM,DRAGEX,'DRAGEX INPUT THIS RUN'
TC65-0870000000 PROCDEF TC69-087
TC65-0870000100 QUALIFY AHTXFER
TC65-0870000200 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=550.2,TIOUT=600.66,TOIN=550.2,TOOUT=563.46
TC65-0870000300 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QTI,TOIN,TOOUT,DTO,QTO,QT
TC65-0870000400 QUALIFY ENGPGM
TC65-0870000500 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC65-0870000600 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0870000700 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC65-0870000800 SET DORE=2.0
TC65-0870000900 DISPLAY IFUEL,IGNON,DORE
TC65-0870001000 QUALIFY ANOZ
TC65-0870001100 AT 360(3);SET DRAGEX=-1080.0/PSIATM;DISPLAY DRAGEX*PSIATM,DRAGEX,'DRAGEX INPUT THIS RUN'
TC65-0950000000 PROCDEF TC69-095
TC65-0950000100 QUALIFY AHTXFER
TC65-0950000150 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=550.4,TIOUT=604.5,TOIN=550.4,TOOUT=566.3
TC65-0950000200 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QTI,TOIN,TOOUT,DTO,QTO,QT
TC65-0950000300 QUALIFY ENGPGM
TC65-0950000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC65-0950000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC65-0950000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC65-0950000700 SET DORE=2.0
TC65-0950000800 DISPLAY IFUEL,IGNON,DORE
TC65-0950000900 QUALIFY ANOZ

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# APPENDIX B (Con't)

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TC69-C99000100 AT 360(3);SET DRAGEX=-1078.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC69-C99000000 PROCDEF TC69-089
TC69-C990000100 QUALIFY AHTXFER
TC69-C990000200 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=550.0,TIOUT=615.2,TOIN=550.0,TOOUT=573.76
TC69-C990000300 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
TC69-C990000400 QUALIFY ENPGM
TC69-C990000500 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC69-C990000600 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC69-C990000700 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC69-C990000800 SET DORE=2.0
TC69-C990000900 DISPLAY IFUEL,IGNON,DORE
TC69-C990001000 QUALIFY AHOZ
TC69-C990001100 AT 360(3);SET DRAGEX=-1085.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC69-C990001200 PROCDEF TC69-110
TC69-C990001300 QUALIFY AHTXFER
TC69-C990001400 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=551.0,TIOUT=646.0,TOIN=551.2,TOOUT=581.0
TC69-C990001500 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
TC69-C990001600 QUALIFY ENPGM
TC69-C990001700 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC69-C990001800 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC69-C990001900 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC69-C990002000 SET DORE=2.0
TC69-C990002100 DISPLAY IFUEL,IGNON,DORE
TC69-C990002200 QUALIFY AHOZ
TC69-C990002300 AT 360(3);SET DRAGEX=-1100.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC69-C990002400 PROCDEF TC69-126
TC69-C990002500 QUALIFY AHTXFER
TC69-C990002600 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=552.2,TIOUT=655.08,TOIN=552.2,TOOUT=581.0
TC69-C990002700 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
TC69-C990002800 QUALIFY ENPGM
TC69-C990002900 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC69-C990003000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC69-C990003100 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC69-C990003200 SET DORE=2.0
TC69-C990003300 DISPLAY IFUEL,IGNON,DORE
TC69-C990003400 QUALIFY AHOZ
TC69-C990003500 AT 360(3);SET DRAGEX=-1430.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC69-C990003600 PROCDEF TC69-159
TC69-C990003700 QUALIFY AHTXFER
TC69-C990003800 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=553.5,TIOUT=649.51,TOIN=553.5,TOOUT=581.76
TC69-C990003900 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
TC69-C990004000 QUALIFY ENPGM
TC69-C990004100 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC69-C990004200 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC69-C990004300 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC69-C990004400 SET DORE=2.0
TC69-C990004500 DISPLAY IFUEL,IGNON,DORE
TC69-C990004600 QUALIFY AHOZ
TC69-C990004700 AT 360(3);SET DRAGEX=-1510.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC69-C990004800 PROCDEF TC69-169
TC69-C990004900 QUALIFY AHTXFER
TC69-C990005000 AT 20;DISPLAY TIIN,TIOUT,TOIN,TOOUT;SET TIIN=555.0,TIOUT=641.64,TOIN=555.0,TOOUT=580.3
TC69-C990005100 AT 40(4);DISPLAY TIIN,TIOUT,DTI,QT1,TOIN,TOOUT,DTO,QTO,QT
TC69-C990005200 QUALIFY ENPGM
TC69-C990005300 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC69-C990005400 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC69-C990005500 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC69-C990005600 SET DORE=2.0
TC69-C990005700 DISPLAY IFUEL,IGNON,DORE
TC69-C990005800 QUALIFY AHOZ
TC69-C990005900 AT 360(3);SET DRAGEX=-1562.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC71-0590000000 PROCDEF TC71-059
TC71-0590000100 QUALIFY AHTXFER
TC71-0590000200 AT 40(4);DISPLAY QT
TC71-0590000300 QUALIFY ENPGM
TC71-0590000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC71-0590000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590000700 SET DORE=2.0
TC71-0590000800 DISPLAY IFUEL,IGNON,DORE
TC71-0590000900 QUALIFY AHOZ
TC71-0590001000 AT 360(3);SET DRAGEX=-1562.0/PSIATH;DISPLAY DRAGEX*PSIATH,DRAGEX,'DRAGEX INPUT THIS RUN'
TC71-0590001100 PROCDEF TC71-071
TC71-0590001200 QUALIFY AHTXFER
TC71-0590001300 AT 40(4);DISPLAY QT
TC71-0590001400 QUALIFY ENPGM
TC71-0590001500 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC71-0590001600 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590001700 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590001800 SET DORE=2.0
TC71-0590001900 DISPLAY IFUEL,IGNON,DORE
TC71-0590002000 PROCDEF TC71-075
TC71-0590002100 QUALIFY AHTXFER
TC71-0590002200 AT 40(4);DISPLAY QT
TC71-0590002300 QUALIFY ENPGM
TC71-0590002400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590002500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590002600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590002700 SET DORE=2.0
TC71-0590002800 DISPLAY IFUEL,IGNON,DORE
TC71-0590002900 PROCDEF TC71-075
TC71-0590003000 QUALIFY AHTXFER
TC71-0590003100 AT 40(4);DISPLAY QT
TC71-0590003200 QUALIFY ENPGM
TC71-0590003300 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590003400 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590003500 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590003600 SET DORE=2.0
TC71-0590003700 DISPLAY IFUEL,IGNON,DORE
TC71-0590003800 PROCDEF TC71-075
TC71-0590003900 QUALIFY AHTXFER
TC71-0590004000 AT 40(4);DISPLAY QT
TC71-0590004100 QUALIFY ENPGM
TC71-0590004200 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590004300 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590004400 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590004500 SET DORE=2.0
TC71-0590004600 DISPLAY IFUEL,IGNON,DORE
TC71-0590004700 PROCDEF TC71-075
TC71-0590004800 QUALIFY AHTXFER
TC71-0590004900 AT 40(4);DISPLAY QT
TC71-0590005000 QUALIFY ENPGM
TC71-0590005100 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590005200 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590005300 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590005400 SET DORE=2.0
TC71-0590005500 DISPLAY IFUEL,IGNON,DORE
TC71-0590005600 PROCDEF TC71-075
TC71-0590005700 QUALIFY AHTXFER
TC71-0590005800 AT 40(4);DISPLAY QT
TC71-0590005900 QUALIFY ENPGM
TC71-0590006000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590006100 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590006200 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590006300 SET DORE=2.0
TC71-0590006400 DISPLAY IFUEL,IGNON,DORE
TC71-0590006500 PROCDEF TC71-075
TC71-0590006600 QUALIFY AHTXFER
TC71-0590006700 AT 40(4);DISPLAY QT
TC71-0590006800 QUALIFY ENPGM
TC71-0590006900 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590007000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590007100 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590007200 SET DORE=2.0
TC71-0590007300 DISPLAY IFUEL,IGNON,DORE
TC71-0590007400 PROCDEF TC71-075
TC71-0590007500 QUALIFY AHTXFER
TC71-0590007600 AT 40(4);DISPLAY QT
TC71-0590007700 QUALIFY ENPGM
TC71-0590007800 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590007900 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590008000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590008100 SET DORE=2.0
TC71-0590008200 DISPLAY IFUEL,IGNON,DORE
TC71-0590008300 PROCDEF TC71-075
TC71-0590008400 QUALIFY AHTXFER
TC71-0590008500 AT 40(4);DISPLAY QT
TC71-0590008600 QUALIFY ENPGM
TC71-0590008700 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590008800 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590008900 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590009000 SET DORE=2.0
TC71-0590009100 DISPLAY IFUEL,IGNON,DORE
TC71-0590009200 PROCDEF TC71-075
TC71-0590009300 QUALIFY AHTXFER
TC71-0590009400 AT 40(4);DISPLAY QT
TC71-0590009500 QUALIFY ENPGM
TC71-0590009600 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-0590009700 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-0590009800 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0590009900 SET DORE=2.0
TC71-0590010000 DISPLAY IFUEL,IGNON,DORE

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# APPENDIX B (Con't)

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TC71-0960000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-0960000000 SET DORE=2.0
TC71-0960000000 DISPLAY IFUEL,IGNON,DORE
TC71-1110000000 PROCDEF TC71-111
TC71-1110000000 QUALIFY AHTXFER
TC71-1110000000 AT 40(4);DISPLAY QT
TC71-1110000000 QUALIFY ENGPGM
TC71-1110000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC71-1110000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1110000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1110000000 SET DORE=2.0
TC71-1110000000 DISPLAY IFUEL,IGNON,DORE
TC71-1530000000 PROCDEF TC71-153
TC71-1530000000 QUALIFY AHTXFER
TC71-1530000000 AT 40(4);DISPLAY QT
TC71-1530000000 QUALIFY ENGPGM
TC71-1530000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC71-1530000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1530000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1530000000 SET DORE=2.0
TC71-1530000000 DISPLAY IFUEL,IGNON,DORE
TC71-1570000000 PROCDEF TC71-157
TC71-1570000000 QUALIFY AHTXFER
TC71-1570000000 AT 40(4);DISPLAY QT
TC71-1570000000 QUALIFY ENGPGM
TC71-1570000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC71-1570000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1570000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1570000000 SET DORE=2.0
TC71-1570000000 DISPLAY IFUEL,IGNON,DORE
TC71-1770000000 PROCDEF TC71-177
TC71-1770000000 QUALIFY AHTXFER
TC71-1770000000 AT 40(4);DISPLAY QT
TC71-1770000000 QUALIFY ENGPGM
TC71-1770000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC71-1770000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1770000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1770000000 SET DORE=2.0
TC71-1770000000 DISPLAY IFUEL,IGNON,DORE
TC71-1810000000 PROCDEF TC71-181
TC71-1810000000 QUALIFY AHTXFER
TC71-1810000000 AT 40(4);DISPLAY QT
TC71-1810000000 QUALIFY ENGPGM
TC71-1810000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC71-1810000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1810000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1810000000 SET DORE=2.0
TC71-1810000000 DISPLAY IFUEL,IGNON,DORE
TC71-1970000000 PROCDEF TC71-197
TC71-1970000000 QUALIFY AHTXFER
TC71-1970000000 AT 40(4);DISPLAY QT
TC71-1970000000 QUALIFY ENGPGM
TC71-1970000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC71-1970000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1970000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1970000000 SET DORE=2.0
TC71-1970000000 DISPLAY IFUEL,IGNON,DORE
TC71-1980000000 PROCDEF TC71-198
TC71-1980000000 QUALIFY AHTXFER
TC71-1980000000 AT 40(4);DISPLAY QT
TC71-1980000000 QUALIFY ENGPGM
TC71-1980000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC71-1980000000 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC71-1980000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC71-1980000000 SET DORE=2.0
TC71-1980000000 DISPLAY IFUEL,IGNON,DORE
TC88-1310000000 PROCDEF TC88-131
TC88-1310000000 QUALIFY AHTXFER
TC88-1310000000 AT 40(4);DISPLAY QT
TC88-1310000000 QUALIFY ENGPGM
TC88-1310000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC88-1310000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC88-1310000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC88-1310000000 SET DORE=2.0
TC88-1310000000 DISPLAY IFUEL,IGNON,DORE
TC88-1410000000 PROCDEF TC88-141
TC88-1410000000 QUALIFY AHTXFER
TC88-1410000000 AT 40(4);DISPLAY QT
TC88-1410000000 QUALIFY ENGPGM
TC88-1410000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC88-1410000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC88-1410000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC88-1410000000 SET DORE=2.0
TC88-1410000000 DISPLAY IFUEL,IGNON,DORE
TC88-1590000000 PROCDEF TC88-159
TC88-1590000000 QUALIFY AHTXFER
TC88-1590000000 AT 40(4);DISPLAY QT
TC88-1590000000 QUALIFY ENGPGM
TC88-1590000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC88-1590000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC88-1590000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC88-1590000000 SET DORE=2.0
TC88-1590000000 DISPLAY IFUEL,IGNON,DORE
TC88-1680000000 PROCDEF TC88-168

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# APPENDIX B (Con't)

TC88-1680000100 QUALIFY AHTXFER  
TC88-1680000200 AT 40(4);DISPLAY QT  
TC88-1680000300 QUALIFY ENGPGM  
TC88-1680000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
TC88-1680000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
TC88-1680000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-1680000700 SET DORE=2.0  
TC88-1680000800 DISPLAY IFUEL,IGNON,DORE  
TC88-1680000900 PROCDEF TC88-169  
TC88-1690000100 QUALIFY AHTXFER  
TC88-1690000200 AT 40(4);DISPLAY QT  
TC88-1690000300 QUALIFY ENGPGM  
TC88-1690000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
TC88-1690000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
TC88-1690000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-1690000700 SET DORE=2.0  
TC88-1690000800 DISPLAY IFUEL,IGNON,DORE  
TC88-1700000900 PROCDEF TC88-170  
TC88-1700000100 QUALIFY AHTXFER  
TC88-1700000200 AT 40(4);DISPLAY QT  
TC88-1700000300 QUALIFY ENGPGM  
TC88-1700000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
TC88-1700000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
TC88-1700000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-1700000700 SET DORE=2.0  
TC88-1700000800 DISPLAY IFUEL,IGNON,DORE  
TC88-1700000900 PROCDEF TC88-178  
TC88-1780000100 QUALIFY AHTXFER  
TC88-1780000200 AT 40(4);DISPLAY QT  
TC88-1780000300 QUALIFY ENGPGM  
TC88-1780000400 SET IFUEL(1)=1,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4  
TC88-1780000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
TC88-1780000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-1780000700 SET DORE=2.0  
TC88-1780000800 DISPLAY IFUEL,IGNON,DORE  
TC88-1860000900 PROCDEF TC88-186  
TC88-1860000100 QUALIFY AHTXFER  
TC88-1860000200 AT 40(4);DISPLAY QT  
TC88-1860000300 QUALIFY ENGPGM  
TC88-1860000400 SET IFUEL(1)=1,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4  
TC88-1860000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
TC88-1860000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-1860000700 SET DORE=2.0  
TC88-1860000800 DISPLAY IFUEL,IGNON,DORE  
TC88-2010000900 PROCDEF TC88-201  
TC88-2010000100 QUALIFY AHTXFER  
TC88-2010000200 AT 40(4);DISPLAY QT  
TC88-2010000300 QUALIFY ENGPGM  
TC88-2010000400 SET IFUEL(1)=1,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4  
TC88-2010000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
TC88-2010000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-2010000700 SET DORE=2.0  
TC88-2010000800 DISPLAY IFUEL,IGNON,DORE  
TC88-2080000900 PROCDEF TC88-208  
TC88-2080000100 QUALIFY AHTXFER  
TC88-2080000200 AT 40(4);DISPLAY QT  
TC88-2080000300 QUALIFY ENGPGM  
TC88-2080000400 SET IFUEL(1)=1,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4  
TC88-2080000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
TC88-2080000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC88-2080000700 SET DORE=2.0  
TC88-2080000800 DISPLAY IFUEL,IGNON,DORE  
TC89-0700000900 PROCDEF TC89-070  
TC89-0700000100 QUALIFY AHTXFER  
TC89-0700000200 AT 40(4);DISPLAY QT  
TC89-0700000300 QUALIFY ENGPGM  
TC89-0700000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
TC89-0700000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
TC89-0700000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
TC89-0700000700 SET DORE=2.0  
TC89-0700000800 DISPLAY IFUEL,IGNON,DORE  
TC89-0940000900 PROCDEF TC89-094  
TC89-0940000100 QUALIFY AHTXFER  
TC89-0940000200 AT 40(4);DISPLAY QT  
TC89-0940000300 QUALIFY ENGPGM  
TC89-0940000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
TC89-0940000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
TC89-0940000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC89-0940000700 SET DORE=2.0  
TC89-0940000800 DISPLAY IFUEL,IGNON,DORE  
TC89-1060000900 PROCDEF TC89-106  
TC89-1060000100 QUALIFY AHTXFER  
TC89-1060000200 AT 40(4);DISPLAY QT  
TC89-1060000300 QUALIFY ENGPGM  
TC89-1060000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
TC89-1060000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
TC89-1060000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
TC89-1060000700 SET DORE=2.0  
TC89-1060000800 DISPLAY IFUEL,IGNON,DORE  
TC89-1140000900 PROCDEF TC89-114  
TC89-1140000100 QUALIFY AHTXFER  
TC89-1140000200 AT 40(4);DISPLAY QT  
TC89-1140000300 QUALIFY ENGPGM  
TC89-1140000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4



# APPENDIX B (Con't)

TC89-1140006500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC89-1140006600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC89-1140006700 SET DORE=2.0  
 TC89-1140006800 DISPLAY IFUEL,IGNON,DORE  
 TC89-1190009000 PROCDEF TC89-119  
 TC89-1190009100 QUALIFY AHTXFER  
 TC89-1190009200 AT 40(4);DISPLAY QT  
 TC89-1190009300 QUALIFY ENGPGM  
 TC89-1190009400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4  
 TC89-1190009500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC89-1190009600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC89-1190009700 SET DORE=2.0  
 TC89-1190009800 DISPLAY IFUEL,IGNON,DORE  
 TC89-1300000000 PROCDEF TC89-130  
 TC89-1300000100 QUALIFY AHTXFER  
 TC89-1300000200 AT 40(4);DISPLAY QT  
 TC89-1300000300 QUALIFY ENGPGM  
 TC89-1300000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4  
 TC89-1300000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC89-1300000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC89-1300000700 SET DORE=2.0  
 TC89-1300000800 DISPLAY IFUEL,IGNON,DORE  
 TC89-1360003000 PROCDEF TC89-136  
 TC89-1360003100 QUALIFY AHTXFER  
 TC89-1360003200 AT 40(4);DISPLAY QT  
 TC89-1360003300 QUALIFY ENGPGM  
 TC89-1360003400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC89-1360003500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC89-1360003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC89-1360003700 SET DORE=2.0  
 TC89-1360003800 DISPLAY IFUEL,IGNON,DORE  
 TC89-1430006000 PROCDEF TC89-143  
 TC89-1430006100 QUALIFY AHTXFER  
 TC89-1430006200 AT 40(4);DISPLAY QT  
 TC89-1430006300 QUALIFY ENGPGM  
 TC89-1430006400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC89-1430006500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC89-1430006600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC89-1430006700 SET DORE=2.0  
 TC89-1430006800 DISPLAY IFUEL,IGNON,DORE  
 TC89-1550000000 PROCDEF TC89-155  
 TC89-1550000100 QUALIFY AHTXFER  
 TC89-1550000200 AT 40(4);DISPLAY QT  
 TC89-1550000300 QUALIFY ENGPGM  
 TC89-1550000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4  
 TC89-1550000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC89-1550000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC89-1550000700 SET DORE=2.0  
 TC89-1550000800 DISPLAY IFUEL,IGNON,DORE  
 TC90-0620000000 PROCDEF TC90-062  
 TC90-0620000100 QUALIFY AHTXFER  
 TC90-0620000200 AT 40(4);DISPLAY QT  
 TC90-0620000300 QUALIFY ENGPGM  
 TC90-0620000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0  
 TC90-0620000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC90-0620000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0  
 TC90-0620000700 SET DORE=2.0  
 TC90-0620000800 DISPLAY IFUEL,IGNON,DORE  
 TC90-0920000000 PROCDEF TC90-092  
 TC90-0920000100 QUALIFY AHTXFER  
 TC90-0920000200 AT 40(4);DISPLAY QT  
 TC90-0920000300 QUALIFY ENGPGM  
 TC90-0920000400 SET IFUEL(1)=5,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC90-0920000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0  
 TC90-0920000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC90-0920000700 SET DORE=2.0  
 TC90-0920000800 DISPLAY IFUEL,IGNON,DORE  
 TC90-0990000000 PROCDEF TC90-099  
 TC90-0990000100 QUALIFY AHTXFER  
 TC90-0990000200 AT 40(4);DISPLAY QT  
 TC90-0990000300 QUALIFY ENGPGM  
 TC90-0990000400 SET IFUEL(1)=5,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0  
 TC90-0990000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
 TC90-0990000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC90-0990000700 SET DORE=2.0  
 TC90-0990000800 DISPLAY IFUEL,IGNON,DORE  
 TC90-1040000000 PROCDEF TC90-104  
 TC90-1040000100 QUALIFY AHTXFER  
 TC90-1040000200 AT 40(4);DISPLAY QT  
 TC90-1040000300 QUALIFY ENGPGM  
 TC90-1040000400 SET IFUEL(1)=5,IFUEL(2)=2,IFUEL(3)=1,IFUEL(4)=0  
 TC90-1040000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
 TC90-1040000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC90-1040000700 SET DORE=2.0  
 TC90-1040000800 DISPLAY IFUEL,IGNON,DORE  
 TC90-1190000000 PROCDEF TC90-119  
 TC90-1190000100 QUALIFY AHTXFER  
 TC90-1190000200 AT 40(4);DISPLAY QT  
 TC90-1190000300 QUALIFY ENGPGM  
 TC90-1190000400 SET IFUEL(1)=5,IFUEL(2)=2,IFUEL(3)=1,IFUEL(4)=0  
 TC90-1190000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=3  
 TC90-1190000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0  
 TC90-1190000700 SET DORE=2.0  
 TC90-1190000800 DISPLAY IFUEL,IGNON,DORE

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# APPENDIX B (Con't)

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TC90-124000000 PROCDEF TC90-124
TC90-124000100 QUALIFY AHTXFER
TC90-124000200 AT 40(4);DISPLAY QT
TC90-124000300 QUALIFY ENGPGM
TC90-124000400 SET IFUEL(1)=5, IFUEL(2)=2, IFUEL(3)=1, IFUEL(4)=0
TC90-124000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC90-124000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC90-124000700 SET DORE=2.0
TC90-124000800 DISPLAY IFUEL, IGNON, DORE
TC90-137000000 PROCDEF TC90-137
TC90-137000100 QUALIFY AHTXFER
TC90-137000200 AT 40(4);DISPLAY QT
TC90-137000300 QUALIFY ENGPGM
TC90-137000400 SET IFUEL(1)=5, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC90-137000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC90-137000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC90-137000700 SET DORE=2.0
TC90-137000800 DISPLAY IFUEL, IGNON, DORE
TC90-138000000 PROCDEF TC90-138
TC90-138000100 QUALIFY AHTXFER
TC90-138000200 AT 40(4);DISPLAY QT
TC90-138000300 QUALIFY ENGPGM
TC90-138000400 SET IFUEL(1)=5, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC90-138000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC90-138000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC90-138000700 SET DORE=2.0
TC90-138000800 DISPLAY IFUEL, IGNON, DORE
TC91-074000000 PROCDEF TC91-074
TC91-074000100 QUALIFY AHTXFER
TC91-074000200 AT 40(4);DISPLAY QT
TC91-074000300 QUALIFY ENGPGM
TC91-074000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-074000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC91-074000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-074000700 SET DORE=2.0
TC91-074000800 DISPLAY IFUEL, IGNON, DORE
TC91-079000000 PROCDEF TC91-079
TC91-079000100 QUALIFY AHTXFER
TC91-079000200 AT 40(4);DISPLAY QT
TC91-079000300 QUALIFY ENGPGM
TC91-079000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-079000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC91-079000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-079000700 SET DORE=2.0
TC91-079000800 DISPLAY IFUEL, IGNON, DORE
TC91-086000000 PROCDEF TC91-086
TC91-086000100 QUALIFY AHTXFER
TC91-086000200 AT 40(4);DISPLAY QT
TC91-086000300 QUALIFY ENGPGM
TC91-086000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC91-086000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC91-086000600 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0
TC91-086000700 SET DORE=2.0
TC91-086000800 DISPLAY IFUEL, IGNON, DORE
TC91-090000000 PROCDEF TC91-090
TC91-090000100 QUALIFY AHTXFER
TC91-090000200 AT 40(4);DISPLAY QT
TC91-090000300 QUALIFY ENGPGM
TC91-090000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-090000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC91-090000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-090000700 SET DORE=2.0
TC91-090000800 DISPLAY IFUEL, IGNON, DORE
TC91-105000000 PROCDEF TC91-105
TC91-105000100 QUALIFY AHTXFER
TC91-105000200 AT 40(4);DISPLAY QT
TC91-105000300 QUALIFY ENGPGM
TC91-105000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-105000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC91-105000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-105000700 SET DORE=2.0
TC91-105000800 DISPLAY IFUEL, IGNON, DORE
TC91-119000000 PROCDEF TC91-119
TC91-119000100 QUALIFY AHTXFER
TC91-119000200 AT 40(4);DISPLAY QT
TC91-119000300 QUALIFY ENGPGM
TC91-119000400 SET IFUEL(1)=0, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-119000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC91-119000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-119000700 SET DORE=2.0
TC91-119000800 DISPLAY IFUEL, IGNON, DORE
TC91-128000000 PROCDEF TC91-128
TC91-128000100 QUALIFY AHTXFER
TC91-128000200 AT 40(4);DISPLAY QT
TC91-128000300 QUALIFY ENGPGM
TC91-128000400 SET IFUEL(1)=0, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-128000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC91-128000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-128000700 SET DORE=2.0
TC91-128000800 DISPLAY IFUEL, IGNON, DORE
TC91-131000000 PROCDEF TC91-131
TC91-131000100 QUALIFY AHTXFER
TC91-131000200 AT 40(4);DISPLAY QT
TC91-131000300 QUALIFY ENGPGM

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# APPENDIX B (Con't)

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TC91-131000400 SET IFUEL(1)=0, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-131000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC91-131000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-131000700 SET DORE=2.0
TC91-131000800 DISPLAY IFUEL, IGNON, DORE
TC91-134000000 PROCDEF TC91-134
TC91-134000100 QUALIFY AHTXFER
TC91-134000200 AT 40(4); DISPLAY QT
TC91-134000300 QUALIFY ENGPGR
TC91-134000400 SET IFUEL(1)=0, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-134000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC91-134000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-134000700 SET DORE=2.0
TC91-134000800 DISPLAY IFUEL, IGNON, DORE
TC91-141000000 PROCDEF TC91-141
TC91-141000100 QUALIFY AHTXFER
TC91-141000200 AT 40(4); DISPLAY QT
TC91-141000300 QUALIFY ENGPGR
TC91-141000400 SET IFUEL(1)=0, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC91-141000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC91-141000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC91-141000700 SET DORE=2.0
TC91-141000800 DISPLAY IFUEL, IGNON, DORE
TC92-070000000 PROCDEF TC92-070
TC92-070000100 QUALIFY AHTXFER
TC92-070000200 AT 40(4); DISPLAY QT
TC92-070000300 QUALIFY ENGPGR
TC92-070000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC92-070000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC92-070000600 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0
TC92-070000700 SET DORE=2.0
TC92-070000800 DISPLAY IFUEL, IGNON, DORE
TC92-070000900 QUALIFY AINLETT
TC92-070001000 AT 3(2); SET VAL(11, INITRO)=0.768, VAL(11, IOXY)=0.232; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
TC92-097000000 PROCDEF TC92-097
TC92-097000100 QUALIFY AHTXFER
TC92-097000200 AT 40(4); DISPLAY QT
TC92-097000300 QUALIFY ENGPGR
TC92-097000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC92-097000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC92-097000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC92-097000700 SET DORE=2.0
TC92-097000800 DISPLAY IFUEL, IGNON, DORE
TC92-097000900 QUALIFY AINLETT
TC92-097001000 AT 3(2); SET VAL(11, INITRO)=0.769, VAL(11, IOXY)=0.231; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
TC92-121000000 PROCDEF TC92-121
TC92-121000100 QUALIFY AHTXFER
TC92-121000200 AT 40(4); DISPLAY QT
TC92-121000300 QUALIFY ENGPGR
TC92-121000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC92-121000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC92-121000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC92-121000700 SET DORE=2.0
TC92-121000800 DISPLAY IFUEL, IGNON, DORE
TC92-121000900 QUALIFY AINLETT
TC92-121001000 AT 3(2); SET VAL(11, INITRO)=0.765, VAL(11, IOXY)=0.235; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
TC92-144000000 PROCDEF TC92-144
TC92-144000100 QUALIFY AHTXFER
TC92-144000200 AT 40(4); DISPLAY QT
TC92-144000300 QUALIFY ENGPGR
TC92-144000400 SET IFUEL(1)=0, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC92-144000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC92-144000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC92-144000700 SET DORE=2.0
TC92-144000800 DISPLAY IFUEL, IGNON, DORE
TC92-144000900 QUALIFY AINLETT
TC92-144001000 AT 3(2); SET VAL(11, INITRO)=0.759, VAL(11, IOXY)=0.241; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
TC92-191000000 PROCDEF TC92-191
TC92-191000100 QUALIFY AHTXFER
TC92-191000200 AT 40(4); DISPLAY QT
TC92-191000300 QUALIFY ENGPGR
TC92-191000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC92-191000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC92-191000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC92-191000700 SET DORE=2.0
TC92-191000800 DISPLAY IFUEL, IGNON, DORE
TC92-191000900 QUALIFY AINLETT
TC92-191001000 AT 3(2); SET VAL(11, INITRO)=0.805, VAL(11, IOXY)=0.195; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
TC92-216000000 PROCDEF TC92-216
TC92-216000100 QUALIFY AHTXFER
TC92-216000200 AT 40(4); DISPLAY QT
TC92-216000300 QUALIFY ENGPGR
TC92-216000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC92-216000500 SET IFUEL(5)=5, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=3
TC92-216000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC92-216000700 SET DORE=2.0
TC92-216000800 DISPLAY IFUEL, IGNON, DORE
TC92-216000900 QUALIFY AINLETT
TC92-216001000 AT 3(2); SET VAL(11, INITRO)=0.800, VAL(11, IOXY)=0.200; DISPLAY VAL(11, INITRO), VAL(11, IOXY)
TC93-039000000 PROCDEF TC93-039
TC93-039000100 QUALIFY AHTXFER
TC93-039000200 AT 40(4); DISPLAY QT
TC93-039000300 QUALIFY ENGPGR
TC93-039000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0

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# APPENDIX B (Con't)

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TC93-0390000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC93-0390000500 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0
TC93-0390000500 SET DORE=2.0
TC93-0390000500 DISPLAY IFUEL, IGNON, DORE
TC93-0390000500 QUALIFY ACMBSTR
TC93-0390000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC93-0460000500 PROCDEF TC93-046
TC93-0460000500 QUALIFY AHTXFER
TC93-0460000500 AT 40(4); DISPLAY QT
TC93-0460000500 QUALIFY ENPGM
TC93-0460000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC93-0460000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC93-0460000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC93-0460000500 SET DORE=2.0
TC93-0460000500 DISPLAY IFUEL, IGNON, DORE
TC93-0570000500 PROCDEF TC93-057
TC93-0570000500 QUALIFY AHTXFER
TC93-0570000500 AT 40(4); DISPLAY QT
TC93-0570000500 QUALIFY ENPGM
TC93-0570000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC93-0570000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC93-0570000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC93-0570000500 SET DORE=2.0
TC93-0570000500 DISPLAY IFUEL, IGNON, DORE
TC93-0570000500 QUALIFY ACMBSTR
TC93-0570000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC93-0660000500 PROCDEF TC93-066
TC93-0660000500 QUALIFY AHTXFER
TC93-0660000500 AT 40(4); DISPLAY QT
TC93-0660000500 QUALIFY ENPGM
TC93-0660000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC93-0660000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC93-0660000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC93-0660000500 SET DORE=2.0
TC93-0660000500 DISPLAY IFUEL, IGNON, DORE
TC93-0660000500 QUALIFY ACMBSTR
TC93-0660000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC93-0710000500 PROCDEF TC93-071
TC93-0710000500 QUALIFY AHTXFER
TC93-0710000500 AT 40(4); DISPLAY QT
TC93-0710000500 QUALIFY ENPGM
TC93-0710000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC93-0710000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC93-0710000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC93-0710000500 SET DORE=2.0
TC93-0710000500 DISPLAY IFUEL, IGNON, DORE
TC93-0710000500 QUALIFY ACMBSTR
TC93-0710000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC93-0840000500 PROCDEF TC93-084
TC93-0840000500 QUALIFY AHTXFER
TC93-0840000500 AT 40(4); DISPLAY QT
TC93-0840000500 QUALIFY ENPGM
TC93-0840000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC93-0840000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC93-0840000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC93-0840000500 SET DORE=2.0
TC93-0840000500 DISPLAY IFUEL, IGNON, DORE
TC93-0840000500 QUALIFY ACMBSTR
TC93-0840000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC93-0930000500 PROCDEF TC93-093
TC93-0930000500 QUALIFY AHTXFER
TC93-0930000500 AT 40(4); DISPLAY QT
TC93-0930000500 QUALIFY ENPGM
TC93-0930000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC93-0930000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC93-0930000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC93-0930000500 SET DORE=2.0
TC93-0930000500 DISPLAY IFUEL, IGNON, DORE
TC93-0930000500 QUALIFY ACMBSTR
TC93-0930000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC94-0330000500 PROCDEF TC94-033
TC94-0330000500 QUALIFY AHTXFER
TC94-0330000500 AT 40(4); DISPLAY QT
TC94-0330000500 QUALIFY ENPGM
TC94-0330000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC94-0330000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC94-0330000500 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0
TC94-0330000500 SET DORE=2.0
TC94-0330000500 DISPLAY IFUEL, IGNON, DORE
TC94-0330000500 QUALIFY ACMBSTR
TC94-0330000500 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC94-0400000500 PROCDEF TC94-040
TC94-0400000500 QUALIFY AHTXFER
TC94-0400000500 AT 40(4); DISPLAY QT
TC94-0400000500 QUALIFY ENPGM
TC94-0400000500 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC94-0400000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC94-0400000500 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC94-0400000500 SET DORE=2.0
TC94-0400000500 DISPLAY IFUEL, IGNON, DORE
TC94-0510000500 PROCDEF TC94-051
TC94-0510000500 QUALIFY AHTXFER
TC94-0510000500 AT 40(4); DISPLAY QT
TC94-0510000500 QUALIFY ENPGM

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# APPENDIX B (Con't)

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TC94-0510003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC94-0510003500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC94-0510003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-0510003700 SET DORE=2.0
TC94-0510003800 DISPLAY IFUEL,IGNON,DORE
TC94-0510003900 QUALIFY ACMBSTR
TC94-0510001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-0590000900 PROCDEF TC94-059
TC94-0590001000 QUALIFY AHTXFER
TC94-0590002000 AT 40(4);DISPLAY QT
TC94-0590003000 QUALIFY ENGPGM
TC94-0590003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC94-0590003500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC94-0590003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-0590003700 SET DORE=2.0
TC94-0590003800 DISPLAY IFUEL,IGNON,DORE
TC94-0590003900 QUALIFY ACMBSTR
TC94-0590001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-0660000900 PROCDEF TC94-066
TC94-0660001000 QUALIFY AHTXFER
TC94-0660002000 AT 40(4);DISPLAY QT
TC94-0660003000 QUALIFY ENGPGM
TC94-0660003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC94-0660003500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC94-0660003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-0660003700 SET DORE=2.0
TC94-0660003800 DISPLAY IFUEL,IGNON,DORE
TC94-0660003900 QUALIFY ACMBSTR
TC94-0660001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-0840000900 PROCDEF TC94-084
TC94-0840001000 QUALIFY AHTXFER
TC94-0840002000 AT 40(4);DISPLAY QT
TC94-0840003000 QUALIFY ENGPGM
TC94-0840003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC94-0840003500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC94-0840003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-0840003700 SET DORE=2.0
TC94-0840003800 DISPLAY IFUEL,IGNON,DORE
TC94-0840003900 QUALIFY ACMBSTR
TC94-0840001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-1220000900 PROCDEF TC94-122
TC94-1220001000 QUALIFY AHTXFER
TC94-1220002000 AT 40(4);DISPLAY QT
TC94-1220003000 QUALIFY ENGPGM
TC94-1220003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC94-1220003500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC94-1220003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-1220003700 SET DORE=2.0
TC94-1220003800 DISPLAY IFUEL,IGNON,DORE
TC94-1230000900 PROCDEF TC94-123
TC94-1230001000 QUALIFY AHTXFER
TC94-1230002000 AT 40(4);DISPLAY QT
TC94-1230003000 QUALIFY ENGPGM
TC94-1230003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC94-1230003500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC94-1230003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-1230003700 SET DORE=2.0
TC94-1230003800 DISPLAY IFUEL,IGNON,DORE
TC94-1230003900 QUALIFY ACMBSTR
TC94-1230001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-1270000900 PROCDEF TC94-127
TC94-1270001000 QUALIFY AHTXFER
TC94-1270002000 AT 40(4);DISPLAY QT
TC94-1270003000 QUALIFY ENGPGM
TC94-1270003400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC94-1270003500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC94-1270003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-1270003700 SET DORE=2.0
TC94-1270003800 DISPLAY IFUEL,IGNON,DORE
TC94-1270003900 QUALIFY ACMBSTR
TC94-1270001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-1410000900 PROCDEF TC94-141
TC94-1410001000 QUALIFY AHTXFER
TC94-1410002000 AT 40(4);DISPLAY QT
TC94-1410003000 QUALIFY ENGPGM
TC94-1410003400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC94-1410003500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC94-1410003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-1410003700 SET DORE=2.0
TC94-1410003800 DISPLAY IFUEL,IGNON,DORE
TC94-1430000900 PROCDEF TC94-143
TC94-1430001000 QUALIFY AHTXFER
TC94-1430002000 AT 40(4);DISPLAY QT
TC94-1430003000 QUALIFY ENGPGM
TC94-1430003400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC94-1430003500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC94-1430003600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC94-1430003700 SET DORE=2.0
TC94-1430003800 DISPLAY IFUEL,IGNON,DORE
TC94-1430003900 QUALIFY ACMBSTR
TC94-1430001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC94-1440000900 PROCDEF TC94-144
TC94-1440001000 QUALIFY AHTXFER
TC94-1440002000 AT 40(4);DISPLAY QT

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# APPENDIX B (Con't)

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TC94-1440000300 QUALIFY ENGPGM
TC94-1440000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC94-1440000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC94-1440000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC94-1440000700 SET DORE=2,0
TC94-1440000800 DISPLAY IFUEL, IGNON, DORE
TC95-0320000000 PROCDEF TC95-032
TC95-0320000100 QUALIFY AHTXFER
TC95-0320000200 AT 40(4); DISPLAY QT
TC95-0320000300 QUALIFY ENGPGM
TC95-0320000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC95-0320000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-0320000600 SET IGNON(1)=0, IGNON(2)=0, IGNON(3)=0
TC95-0320000700 SET DORE=2,0
TC95-0320000800 DISPLAY IFUEL, IGNON, DORE
TC95-0320000900 QUALIFY ACMBSTR
TC95-0320001000 AT 350(3); SET XCTP=XCT; DISPLAY XSLE, XCT, XCTP, XSTE, 'SUBSONIC COMBUSTION'
TC95-0440000000 PROCDEF TC95-044
TC95-0440000100 QUALIFY AHTXFER
TC95-0440000200 AT 40(4); DISPLAY QT
TC95-0440000300 QUALIFY ENGPGM
TC95-0440000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=0
TC95-0440000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-0440000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-0440000700 SET DORE=2,0
TC95-0440000800 DISPLAY IFUEL, IGNON, DORE
TC95-0660000000 PROCDEF TC95-066
TC95-0660000100 QUALIFY AHTXFER
TC95-0660000200 AT 40(4); DISPLAY QT
TC95-0660000300 QUALIFY ENGPGM
TC95-0660000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC95-0660000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-0660000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-0660000700 SET DORE=2,0
TC95-0660000800 DISPLAY IFUEL, IGNON, DORE
TC95-0760000000 PROCDEF TC95-076
TC95-0760000100 QUALIFY AHTXFER
TC95-0760000200 AT 40(4); DISPLAY QT
TC95-0760000300 QUALIFY ENGPGM
TC95-0760000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4
TC95-0760000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-0760000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-0760000700 SET DORE=2,0
TC95-0760000800 DISPLAY IFUEL, IGNON, DORE
TC95-0980000000 PROCDEF TC95-098
TC95-0980000100 QUALIFY AHTXFER
TC95-0980000200 AT 40(4); DISPLAY QT
TC95-0980000300 QUALIFY ENGPGM
TC95-0980000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC95-0980000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-0980000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-0980000700 SET DORE=2,0
TC95-0980000800 DISPLAY IFUEL, IGNON, DORE
TC95-1060000000 PROCDEF TC95-106
TC95-1060000100 QUALIFY AHTXFER
TC95-1060000200 AT 40(4); DISPLAY QT
TC95-1060000300 QUALIFY ENGPGM
TC95-1060000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC95-1060000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-1060000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-1060000700 SET DORE=2,0
TC95-1060000800 DISPLAY IFUEL, IGNON, DORE
TC95-1150000000 PROCDEF TC95-115
TC95-1150000100 QUALIFY AHTXFER
TC95-1150000200 AT 40(4); DISPLAY QT
TC95-1150000300 QUALIFY ENGPGM
TC95-1150000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC95-1150000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-1150000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-1150000700 SET DORE=2,0
TC95-1150000800 DISPLAY IFUEL, IGNON, DORE
TC95-1230000000 PROCDEF TC95-123
TC95-1230000100 QUALIFY AHTXFER
TC95-1230000200 AT 40(4); DISPLAY QT
TC95-1230000300 QUALIFY ENGPGM
TC95-1230000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC95-1230000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-1230000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-1230000700 SET DORE=2,0
TC95-1230000800 DISPLAY IFUEL, IGNON, DORE
TC95-1300000000 PROCDEF TC95-130
TC95-1300000100 QUALIFY AHTXFER
TC95-1300000200 AT 40(4); DISPLAY QT
TC95-1300000300 QUALIFY ENGPGM
TC95-1300000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=4
TC95-1300000500 SET IFUEL(5)=0, IFUEL(6)=0, IFUEL(7)=0, IFUEL(8)=0
TC95-1300000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC95-1300000700 SET DORE=2,0
TC95-1300000800 DISPLAY IFUEL, IGNON, DORE
TC95-1420000000 PROCDEF TC95-142
TC95-1420000100 QUALIFY AHTXFER
TC95-1420000200 AT 40(4); DISPLAY QT
TC95-1420000300 QUALIFY ENGPGM
TC95-1420000400 SET IFUEL(1)=1, IFUEL(2)=2, IFUEL(3)=0, IFUEL(4)=4

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# APPENDIX B (Con't)

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TC95-1420000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-1420000630 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-1420000700 SET DORE=2.0
TC95-1420000800 DISPLAY IFUEL,IGNON,DORE
TC95-1560000000 PROCDEF TC95-156
TC95-1560000100 QUALIFY AHTXFER
TC95-1560000200 AT 40(4);DISPLAY QT
TC95-1560000300 QUALIFY ENGPGM
TC95-1560000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC95-1560000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-1560000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC95-1560000700 SET DORE=2.0
TC95-1560000800 DISPLAY IFUEL,IGNON,DORE
TC95-1560000900 QUALIFY ACMBSTR
TC95-1560001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC95-1690000000 PROCDEF TC95-169
TC95-1690000100 QUALIFY AHTXFER
TC95-1690000200 AT 40(4);DISPLAY QT
TC95-1690000300 QUALIFY ENGPGM
TC95-1690000400 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=4
TC95-1690000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-1690000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-1690000700 SET DORE=2.0
TC95-1690000800 DISPLAY IFUEL,IGNON,DORE
TC95-2100000000 PROCDEF TC95-210
TC95-2100000100 QUALIFY AHTXFER
TC95-2100000200 AT 40(4);DISPLAY QT
TC95-2100000300 QUALIFY ENGPGM
TC95-2100000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC95-2100000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-2100000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-2100000700 SET DORE=2.0
TC95-2100000800 DISPLAY IFUEL,IGNON,DORE
TC95-2330000000 PROCDEF TC95-233
TC95-2330000100 QUALIFY AHTXFER
TC95-2330000200 AT 40(4);DISPLAY QT
TC95-2330000300 QUALIFY ENGPGM
TC95-2330000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC95-2330000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-2330000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-2330000700 SET DORE=2.0
TC95-2330000800 DISPLAY IFUEL,IGNON,DORE
TC95-2410000000 PROCDEF TC95-241
TC95-2410000100 QUALIFY AHTXFER
TC95-2410000200 AT 40(4);DISPLAY QT
TC95-2410000300 QUALIFY ENGPGM
TC95-2410000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC95-2410000500 SET IFUEL(5)=5,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-2410000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-2410000700 SET DORE=2.0
TC95-2410000800 DISPLAY IFUEL,IGNON,DORE
TC95-0340000000 PROCDEF TC95-034
TC95-0340000100 QUALIFY AHTXFER
TC95-0340000200 AT 40(4);DISPLAY QT
TC95-0340000300 QUALIFY ENGPGM
TC95-0340000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC95-0340000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-0340000600 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC95-0340000700 SET DORE=2.0
TC95-0340000800 DISPLAY IFUEL,IGNON,DORE
TC95-0340000900 QUALIFY ACMBSTR
TC95-0340001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC95-0420000000 PROCDEF TC95-042
TC95-0420000100 QUALIFY AHTXFER
TC95-0420000200 AT 40(4);DISPLAY QT
TC95-0420000300 QUALIFY ENGPGM
TC95-0420000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC95-0420000500 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC95-0420000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-0420000700 SET DORE=2.0
TC95-0420000800 DISPLAY IFUEL,IGNON,DORE
TC95-0520000000 PROCDEF TC95-052
TC95-0520000100 QUALIFY AHTXFER
TC95-0520000200 AT 40(4);DISPLAY QT
TC95-0520000300 QUALIFY ENGPGM
TC95-0520000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=4
TC95-0520000500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC95-0520000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-0520000700 SET DORE=2.0
TC95-0520000800 DISPLAY IFUEL,IGNON,DORE
TC95-0520000900 QUALIFY ACMBSTR
TC95-0520001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC95-0690000000 PROCDEF TC95-069
TC95-0690000100 QUALIFY AHTXFER
TC95-0690000200 AT 40(4);DISPLAY QT
TC95-0690000300 QUALIFY ENGPGM
TC95-0690000400 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC95-0690000500 SET IFUEL(5)=0,IFUEL(6)=5,IFUEL(7)=5,IFUEL(8)=0
TC95-0690000600 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC95-0690000700 SET DORE=2.0
TC95-0690000800 DISPLAY IFUEL,IGNON,DORE
TC95-0690000900 QUALIFY ACMBSTR
TC95-0690001000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC95-0760000000 PROCDEF TC95-076

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# APPENDIX B (Con't)

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TC96-0760000000 QUALIFY AHTXFER
TC96-0760000000 AT 40(4);DISPLAY QT
TC96-0760000000 QUALIFY ENGPGR
TC96-0760000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC96-0760000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-0760000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-0760000000 SET DORE=2.0
TC96-0760000000 DISPLAY IFUEL,IGNON,DORE
TC96-0760000000 QUALIFY ACM3STR
TC96-0760000000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC96-0850000000 PROCDEF TC96-085
TC96-0850000000 QUALIFY AHTXFER
TC96-0850000000 AT 40(4);DISPLAY QT
TC96-0850000000 QUALIFY ENGPGR
TC96-0850000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC96-0850000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-0850000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-0850000000 SET DORE=2.0
TC96-0850000000 DISPLAY IFUEL,IGNON,DORE
TC96-0850000000 QUALIFY ACM3STR
TC96-0850000000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC96-1560000000 PROCDEF TC96-156
TC96-1560000000 QUALIFY AHTXFER
TC96-1560000000 AT 40(4);DISPLAY QT
TC96-1560000000 QUALIFY ENGPGR
TC96-1560000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC96-1560000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-1560000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-1560000000 SET DORE=2.0
TC96-1560000000 DISPLAY IFUEL,IGNON,DORE
TC96-1560000000 QUALIFY ACM3STR
TC96-1560000000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC96-1780000000 PROCDEF TC96-178
TC96-1780000000 QUALIFY AHTXFER
TC96-1780000000 AT 40(4);DISPLAY QT
TC96-1780000000 QUALIFY ENGPGR
TC96-1780000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=3,IFUEL(4)=0
TC96-1780000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-1780000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-1780000000 SET DORE=2.0
TC96-1780000000 DISPLAY IFUEL,IGNON,DORE
TC96-1900000000 PROCDEF TC96-190
TC96-1900000000 QUALIFY AHTXFER
TC96-1900000000 AT 40(4);DISPLAY QT
TC96-1900000000 QUALIFY ENGPGR
TC96-1900000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC96-1900000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-1900000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-1900000000 SET DORE=2.0
TC96-1900000000 DISPLAY IFUEL,IGNON,DORE
TC96-1910000000 PROCDEF TC96-191
TC96-1910000000 QUALIFY AHTXFER
TC96-1910000000 AT 40(4);DISPLAY QT
TC96-1910000000 QUALIFY ENGPGR
TC96-1910000000 SET IFUEL(1)=1,IFUEL(2)=2,IFUEL(3)=0,IFUEL(4)=0
TC96-1910000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-1910000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-1910000000 SET DORE=2.0
TC96-1910000000 DISPLAY IFUEL,IGNON,DORE
TC96-2120000000 PROCDEF TC96-212
TC96-2120000000 QUALIFY AHTXFER
TC96-2120000000 AT 40(4);DISPLAY QT
TC96-2120000000 QUALIFY ENGPGR
TC96-2120000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC96-2120000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-2120000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC96-2120000000 SET DORE=2.0
TC96-2120000000 DISPLAY IFUEL,IGNON,DORE
TC96-2120000000 QUALIFY ACM3STR
TC96-2120000000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC96-2330000000 PROCDEF TC96-233
TC96-2330000000 QUALIFY AHTXFER
TC96-2330000000 AT 40(4);DISPLAY QT
TC96-2330000000 QUALIFY ENGPGR
TC96-2330000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC96-2330000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC96-2330000000 SET IGNON(1)=0,IGNON(2)=1,IGNON(3)=0
TC96-2330000000 SET DORE=2.0
TC96-2330000000 DISPLAY IFUEL,IGNON,DORE
TC96-2330000000 QUALIFY ACM3STR
TC96-2330000000 AT 350(3);SET XCTP=XCT;DISPLAY XSLE,XCT,XCTP,XSTE,'SUBSONIC COMBUSTION'
TC97-0290000000 PROCDEF TC97-029
TC97-0290000000 QUALIFY AHTXFER
TC97-0290000000 AT 40(4);DISPLAY QT
TC97-0290000000 QUALIFY ENGPGR
TC97-0290000000 SET IFUEL(1)=0,IFUEL(2)=0,IFUEL(3)=0,IFUEL(4)=0
TC97-0290000000 SET IFUEL(5)=0,IFUEL(6)=0,IFUEL(7)=0,IFUEL(8)=0
TC97-0290000000 SET IGNON(1)=0,IGNON(2)=0,IGNON(3)=0
TC97-0290000000 SET DORE=2.0
TC97-0290000000 DISPLAY IFUEL,IGNON,DORE
TC97-0520000000 PROCDEF TC97-052
TC97-0520000000 QUALIFY AHTXFER
TC97-0520000000 AT 40(4);DISPLAY QT
TC97-0520000000 QUALIFY ENGPGR

```

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# APPENDIX B (Con't)

```

TC97-0520000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-0520000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-0520000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-0520000700 SET DORE=2.0
TC97-0520000800 DISPLAY IFUEL, IGNON, DORE
TC97-0570000000 PROCDEF TC97-057
TC97-0570000100 QUALIFY AHTXFER
TC97-0570000200 AT 40(4); DISPLAY QT
TC97-0570000300 QUALIFY ENPGM
TC97-0570000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-0570000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-0570000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-0570000700 SET DORE=2.0
TC97-0570000800 DISPLAY IFUEL, IGNON, DORE
TC97-0610000000 PROCDEF TC97-061
TC97-0610000100 QUALIFY AHTXFER
TC97-0610000200 AT 40(4); DISPLAY QT
TC97-0610000300 QUALIFY ENPGM
TC97-0610000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-0610000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-0610000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-0610000700 SET DORE=2.0
TC97-0610000800 DISPLAY IFUEL, IGNON, DORE
TC97-1020000000 PROCDEF TC97-102
TC97-1020000100 QUALIFY AHTXFER
TC97-1020000200 AT 40(4); DISPLAY QT
TC97-1020000300 QUALIFY ENPGM
TC97-1020000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-1020000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-1020000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-1020000700 SET DORE=2.0
TC97-1020000800 DISPLAY IFUEL, IGNON, DORE
TC97-1280000000 PROCDEF TC97-128
TC97-1280000100 QUALIFY AHTXFER
TC97-1280000200 AT 40(4); DISPLAY QT
TC97-1280000300 QUALIFY ENPGM
TC97-1280000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-1280000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-1280000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-1280000700 SET DORE=2.0
TC97-1280000800 DISPLAY IFUEL, IGNON, DORE
TC97-1590000000 PROCDEF TC97-159
TC97-1590000100 QUALIFY AHTXFER
TC97-1590000200 AT 40(4); DISPLAY QT
TC97-1590000300 QUALIFY ENPGM
TC97-1590000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-1590000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-1590000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-1590000700 SET DORE=2.0
TC97-1590000800 DISPLAY IFUEL, IGNON, DORE
TC97-1800000000 PROCDEF TC97-180
TC97-1800000100 QUALIFY AHTXFER
TC97-1800000200 AT 40(4); DISPLAY QT
TC97-1800000300 QUALIFY ENPGM
TC97-1800000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-1800000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-1800000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-1800000700 SET DORE=2.0
TC97-1800000800 DISPLAY IFUEL, IGNON, DORE
TC97-2070000000 PROCDEF TC97-207
TC97-2070000100 QUALIFY AHTXFER
TC97-2070000200 AT 40(4); DISPLAY QT
TC97-2070000300 QUALIFY ENPGM
TC97-2070000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-2070000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-2070000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-2070000700 SET DORE=2.0
TC97-2070000800 DISPLAY IFUEL, IGNON, DORE
TC97-2310000000 PROCDEF TC97-231
TC97-2310000100 QUALIFY AHTXFER
TC97-2310000200 AT 40(4); DISPLAY QT
TC97-2310000300 QUALIFY ENPGM
TC97-2310000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-2310000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-2310000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-2310000700 SET DORE=2.0
TC97-2310000800 DISPLAY IFUEL, IGNON, DORE
TC97-2360000000 PROCDEF TC97-236
TC97-2360000100 QUALIFY AHTXFER
TC97-2360000200 AT 40(4); DISPLAY QT
TC97-2360000300 QUALIFY ENPGM
TC97-2360000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-2360000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-2360000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-2360000700 SET DORE=2.0
TC97-2360000800 DISPLAY IFUEL, IGNON, DORE
TC97-2400000000 PROCDEF TC97-240
TC97-2400000100 QUALIFY AHTXFER
TC97-2400000200 AT 40(4); DISPLAY QT
TC97-2400000300 QUALIFY ENPGM
TC97-2400000400 SET IFUEL(1)=0, IFUEL(2)=0, IFUEL(3)=0, IFUEL(4)=0
TC97-2400000500 SET IFUEL(5)=0, IFUEL(6)=5, IFUEL(7)=5, IFUEL(8)=0
TC97-2400000600 SET IGNON(1)=0, IGNON(2)=1, IGNON(3)=0
TC97-2400000700 SET DORE=2.0
TC97-2400000800 DISPLAY IFUEL, IGNON, DORE

```



# APPENDIX B (Con't)

```

TH20 0000000 PROCDEF TH20
TH20 0000100 QUALIFY CONVTA
TH20 0000150 DISPLAY MV(288),MV(362),MV(370),MV(371),MV(372),MV(373),MV(374),MV(380),MV(381)
TH20 0000200 DISPLAY CH(288),CH(362),CH(370),CH(371),CH(372),CH(373),CH(374),CH(380),CH(381)
TIME 0000000 PROCDEF TIME
TIME 0000100 QUALIFY AOUT1
TIME 0000200 DISPLAY ILAPSE
TUNNOPT 0000000 PROCDEF TUNNOPT
TUNNOPT 0000100 PARAM $1
TUNNOPT 0000200 QUALIFY AINLETT
TUNNOPT 0000300 AT 2000(3);SET INTOPT=$1;DISPLAY INTOPT
TURKEY 0000000 PROCDEF TURKEY
TURKEY 0000100 PARAM NUM
TURKEY 0000200 DEFAULT SYSINX=E
TURKEY 0000300 PROCDEF CONUM
TURKEY 0000400 INSERT LAST
TURKEY 0000500 KDOSEL 399
TURKEY 0000600 _END
TURKEY 0000700 DEFAULT SYSINX=G
UPDLIB 0000000 PROCDEF UPDLIB
UPDLIB 0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10,$11,$12,$13,$14,$15
UPDLIB 0000200 DSS? $1
UPDLIB 0000300 POD? $1,,Y
UPDLIB 0000400 IF '$2'='';UPDLIB $2,$3,$4,$5,$6,$7,$8,$9,$10,$11,$12,$13,$14,$15
WIPEOUT 0000000 PROCDEF WIPEOUT
WIPEOUT 0000100 PARAM $1,$2,$3,$4,$5,$6,$7,$8,$9,$10
WIPEOUT 0000200 ERASE PRNT$1
WIPEOUT 0000300 IF '$2'='';WIPEOUT $2,$3,$4,$5,$6,$7,$8,$9,$10

```



## APPENDIX C

### TYPICAL PROGRAM EXECUTION

A typical session on the IBM 2741 typewriter terminal was reproduced in Table C-1. The user entries were made in lower-case characters while the computer and program outputs and prompts were received in upper-case characters. The user entries in Table C-1 were tagged with numbered arrows to aid in the description of the user control of program execution.

After the user dialed the IBM 360-67, the computer responded with the first line containing port identification and then prompted the user for his terminal identification which user entered at ①\*. The computer was satisfied with the response and invited the user to LOGON which he did at ② with user identification and password. User requested available computer resources at ③ and the identification of total users at ④ to determine if sufficient resources were available to execute the data-reduction program and to obtain an estimate of the turn-around times. Both appeared to be satisfactory, and the program was loaded at ⑤.

After printing library assignments and loading information, the computer prompted for the 'INPUT LINE DSNAME' which was input at ⑥. The applicable procedures for Reading 60 were obtained from Table 10-4 and entered at ⑦, ⑧, ⑩, ⑪ and ⑫. The procedure 'SET34' prompted the user to obtain the raw data at ⑨. The entry at ⑫ set the fuel injector configuration in the array IFUEL and caused the array to be printed on the typewriter. Each sequential location in the array corresponded to the injectors 1A, 1B, 1C, 2A, 2C, 3A, 3B and 4, respectively.

\*Circled numbers refer to numbered arrows in Table C-1.





## APPENDIX C

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\*Circled numbers refer to numbered arrows in Table C-1.



## APPENDIX C (con't)

When an injector was not used, a zero was stored in the appropriate location in the array. When an injector was used during a test, the appropriate location in the array contained a number, 1 through 5, which corresponded to the fuel manifold valves A through E, respectively, to which the injector was connected. Injectors 1A, 1C and 2C could be connected to valves A or E (1 or 5), 3A and 3B to valve E (5) only, 1B to valve B (2) only, 2A to valve D (4) only, and 4 to valve C (3) only. The entry at (12) also set the three igniters false (off) in the logical array IGNØN.

Next, the main program, TSKTSK, was executed at (13). The program prompted the user with WHERE TO? >, and he responded with 'h' at (14) to indicate that data from a new reading (test) would be used. At (15), the user requested the CPU time, pages and paging rate used in loading the program, at (16), he reinitialized these parameters and, at (17), he caused the program to resume execution.

The entries of facility and program and reading numbers at (18), (19), and (20) gave the location and identification of the data to the program, and d (for data) was entered at (21) to define the reading type. The entry y (for yes) at (22) caused the program to omit printing the engineering units report, and the block number 107 of Reading 60 was entered at (25) to resume execution of the program.

At the completion of execution of block 107, the program prompted the user with WHERE TO? >, and he responded with s (for stop) at (26). The performance output was stored in a temporary data set (PRNT64) and directed to the remote batch terminal at (27) by use of the procedure PUKÉ.



## APPENDIX C (con't)

In order to execute another block of Reading 60, it was necessary to remove the PCS commands initiated at ①② which were assigned the numbers 9 and 10. This was accomplished by the entry at ②⑧, and the heat transfer data and injector and igniter configurations for Block 130 were entered at ②⑨. The main program was executed again at ③②, and the program responded with WHERE TO? >\_. The user entered b (for block) at ③③ and the block number at ③④. Execution of Block No. 130 was completed at ③⑤, temporary storage of completed print files cleaned up at ③⑥ and the performance output printed at ③⑦.



# APPENDIX C :

## TABLE C-1

```

ENTER TERM ID-ba009 ← ①
PLEASE LOGON
?
logon aeeal, saeg ← ②
TSS/360 RELEASE 9.0
TASKID=0471 ← ③ → DO READBOX GETNEWS, FACILITY <- LOGON AT 00:57 ON 03/05/75.
usage ← ③
USAGE FOR AEEAL*** /TEMP STOR=1000;583;4.98E 04/PERM STOR=900;582;1.51E 05
/DA DEV=1;/MAG TAP=2;0;3.37E-01/PRINTERS=0;/RD-PUN=0;/DATA CELL=1749;
/TSS TASKS=1;/BULKOUT=1343624/CPU TIME=70.0.0;0.01.053;65.3.33/
CONN TIME=1000.0.0;0.0.52;684.53.15;
/PAGING RATE=89 ← ④
exhibit uid ← ④
ACTIVE USER STATUS AT 00:58:42 03/05/75
USERID TID TYPE SYS1
SYSOPERO 1 CONV 48 UUUUNE** 470 BACK 2774 AEEAL*** 471 CONV
BF SYSOPERC 2 BACK 3024 XXMON*** 446 CONV 95
ICCICA** 291 BACK 18 YYBUDA** 288 CONV F6
hrerun5 ← ⑤
BDCNXX, BDENXX, & PSBLKXX VS. READING NUMBER - DO -----> XREF
LIB10 IS D360LIB
LIB20 IS DATASYS.DATSYS
LIB30 IS LNKBB3
LIB40 IS GPMLIB94
LIB50 IS DATASYS.VINCE
LIB70 IS NEWNEW.
LIB80 IS TESTCD1
LIB90 IS VINCENEW
LIB100 IS VINNEW2
LIB110 IS DATASYS.DAN
LIB120 IS TESHRE
LIB130 IS NEWLIB
BLOCK DATA LOADED: PSBLK70
BLOCK DATA LOADED: BDEN35
BLOCK DATA LOADED: BDCN49
PROCEEDING: MODULE ADATA PRODUCED WITH LEVEL 1 ERRORS
BLOCK DATA LOADED: ADATA
BLOCK DATA LOADED: NGAS3
UNDEFINED REF ANALYS IN MODULE TSKTSK . ADDRESS FFFFF000 ASSIGNED
TSKTSK LOADED
TYPE YOUR LINE DSNAME. UP TO 20 CHARS.
INPUT LINE DSNAME = rdg50 ← ⑥
TERMINATED: STOP ← ⑦
ds71 ← ⑦
PS71 VALID FOR READINGS 71, 64, 63, 61, 60, 57, 54, 52
00001
00002
set34 ← ⑧
00003
00004
00005
00006
00007
----->> DO ----->> GRABBER XX <-----
grabber 60 ← ⑨
CANCELLED: YHTFX2.T001 UNKNOWN.
TEMP RESTORE set61 ← ⑩
to60 ← ⑪
NK0SEL=19
NK0SEL=36
NK0SEL=38
NK0SEL=39
00008
to60-107 ← ⑫
00009
00010
IFUEL =
(1) 1 2 0 0
IGNON = 5 0 0 0
(1) .F. .F. .F.
DORE=+.10000000E+01

```



# APPENDIX C (Con't)

## TABLE C-1 (Con't)

```

tasksk ← (13)
  WHEN THE MESSAGE 'WHERE TO?' TYPES UP, --ENTER APPROPRIATE CODE
  WHERE TO? >h ← (14)
  PROCEEDING: PAUSE SET ANY NECESSARY CONSTANTS, THEN TYPE GO
taskuse ? ← (15)
CPU TIME (SEC)=31.134, TIME SLICES=113
PAGING (PGS-PGS/SEC)
4573-146
taskuse on ← (16)
go ← (17)
  PROCEEDING (PCS): EXECUTION CONTINUES AT CHCRWC.(X'4C14')
  ENTER THE FOLLOWING CODES FOR SEL WHEN READING IS REQUESTED --
  E IF EC'S ONLY, B IF DATA AND EC'S, C IF CALIBRATION,
  L FOR LOWS, H FOR HIGHS, D FOR DATA
  ENTER FACILITY UP TO 8 CHARACTERS
htfx2 ← (18)
  ENTER 4 DIGIT PROGRAM NUMBER
1001 ← (19)
  ENTER READING NUMBER TO BE PROCESSED
60 ← (20)
  ENTER READING TYPE
d ← (21)
  LEVEL IS 20 AT BLOCK 1
  LEVEL IS 26 AT BLOCK 3
  LEVEL IS 06 AT BLOCK 6
  LEVEL IS 95 AT BLOCK 179
  LEVEL IS 26 AT BLOCK 194
  LEVEL IS 20 AT BLOCK 197
  LEVEL IS 20 END BLOCK AT 198
  DO YOU WANT TO PROCESS THE SPECIAL GAS SAMPLE ANALYZER RESUME DATA? Y OR N
n ← (22)
  SKIP RESUME?
y ← (23)
  TYPE Y TO USE THIS READING, H TO REQUEST ANOTHER READING,
  S TO STOP, N TO USE THIS READING BUT SKIP BLOCK REQ
y ← (24)
  ENTER BLOCKS FOR PROCESSING
107 ← (25)
00008
VAL(11,1)=+.73613000E+00
VAL(11,2)=+.26386994E+00
00005
  PROCEEDING (PCS): EXECUTION CONTINUES AT ASURFPS.4(3)
00001
00006
  PROCEEDING (PCS): EXECUTION CONTINUES AT ASURFPS.26(7)
00002
00004
XCL=+.35220764E+02
CDADD=+.56724530E-03
AOAC(1)=+.98380917E+00
DELTAX=+.33677673E+00
00003
  PROCEEDING (PCS): EXECUTION CONTINUES AT AINLETT.58
00009
00010
DTI=+.72299988E+02
DTO=+.33000000E+02
QTI=+.19810198E+04
QTO=+.29604299E+04
QT=+.49414492E+04
TIIN=+.55869995E+03
TIOUT=+.63100000E+03
TOIN=+.55869995E+03
TOOUT=+.59169995E+03
WHERE TO? >s ← (26)
  TERMINATED: STOP

```



# APPENDIX C (Con't)

## TABLE C-1 (Con't)

duke 64 ← (27)  
 CANCELLED: PRNT64 UNKNOWN.  
 LIBR64 IS PRNT64  
 PRINT BSN=2990, 1700 LINES  
 remove 9,10 ← (28)  
 tc60-130 ← (29)  
 00011  
 00012  
 IFUEL =  
 (1)                      1                      0                      0                      4  
                             5                      0                      0                      0  
 IONON =  
 (1) .F. .F. .F.  
 DORE=+.10000000E+01  
 taskuse 7 ← (30)  
 CPUTIME(SEC)=252.854, TIME SLICES=235  
 PAGING (PGS-PGS/SEC)  
 12094-47  
 taskuse on ← (31)  
 tasksk ← (32)  
 WHERE TO? >b ← (33)  
 ENTER BLOCKS FOR PROCESSING  
 130 ← (34)  
 00008  
 VAL(11,1)=+.73613000E+00  
 VAL(11,2)=+.26386994E+00  
 00005  
 PROCEEDING(PCS): EXECUTION CONTINUES AT ASURFPS.4(3)  
 00001  
 00006  
 PROCEEDING(PCS): EXECUTION CONTINUES AT ASURFPS.26(7)  
 00002  
 00004  
 XCL=+.35202820E+02  
 CDADD=+.48097968E-03  
 AOAC(1)=+.98522842E+00  
 DELTAX=+.31883240E+00  
 00003  
 PROCEEDING(PCS): EXECUTION CONTINUES AT AINLETT.58  
 00011  
 00012  
 DTI=+.85000000E+02  
 DTO=+.32399994E+02  
 QTI=+.23290000E+04  
 QTO=+.29065999E+04  
 QT=+.52355977E+04  
 TIIN=+.56000000E+03  
 TIOUT=+.64500000E+03  
 TOIN=+.56000000E+03  
 TOOUT=+.59239990E+03  
 WHERE TO? >s ← (35)  
 TERMINATED: STOP  
 wipeout 45,46,47,48,49,50,51,52, ← (36)  
 CANCELLED: PRNT45 UNKNOWN.  
 CANCELLED: PRNT46 UNKNOWN.  
 CANCELLED: PRNT47 UNKNOWN.  
 CANCELLED: PRNT48 UNKNOWN.  
 CANCELLED: PRNT49 UNKNOWN.  
 CANCELLED: PRNT50 UNKNOWN.  
 duke 65 ← (37)  
 CANCELLED: PRNT65 UNKNOWN.  
 LIBR65 IS PRNT65  
 PRINT BSN=2992, 1600 LINES

*E. N. D.*

